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JOURNAL OF ELECTRICITY

POWER AND GAS

Devoted to the Conversion, Transmission and Distribution of Energy

Entered as second-class matter May 7, 1906, at the Post Office at San Francisco, Cal., under the Act of Congress March 3, 1879

VOL. XXIII No. 16 | SAN FRANCISCO, OCTOBER 16, 1909 | PER COPY, 10 CENTS

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JOURNAL OF ELECTRICITY
POWER AND GAS
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VOLUME XXIII SAN FRANCISCO, OCTOBER 16, 1909 NUMBER 16

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HANFORD IRRIGATION AND POWER DEVELOPMENT.

With the successful operation of the large power plant at Priest Rapids on the Columbia River, constructed by the Hanford Irrigation & Power Company, a Seattle corporation, the development of electric power from water power in the Columbia River Valley has been given an auspicious start.

To gain an idea of the great possibilities of electrical development from waterpower in the Columbia River Valley, one need merely refer to the Government report on waterpower in the State of Washington. From the southern border of the State, formed by the Columbia itself, to the point where the great stream enters the State through the northern boundary, rapids and falls are of frequent occurrence in the river, producing available power aggregating over a million horsepower, sufficient to generate enough electricity to irrigate millions of acres of now arid lands and to operate the electric railways, light and heat the cities and operate the machinery of the future in the valley.

Rock Island Falls, producing 190,000 h. p.; Priest Rapids, producing 188,000; Kettle Falls, producing 100,000 and the falls and rapids in the vicinity of the Grand Dalles, on the lower Columbia, producing 236,000 h. p. are the main power sites. A large number of smaller waterpowers are susceptible to profitable development.

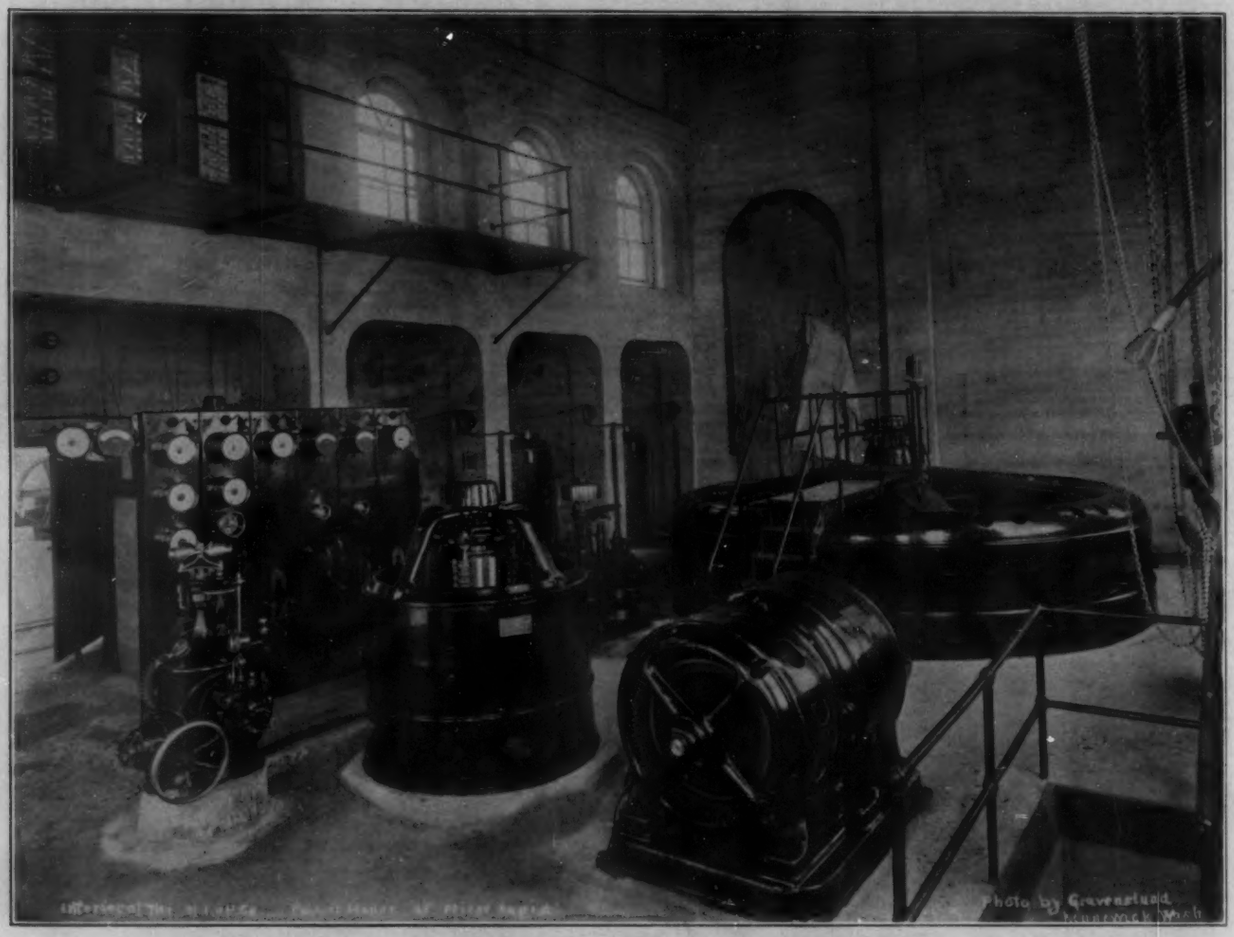
Of all this immense waterpower, the Priest Rapids power is the first to be developed; that is, a part of it has been developed by the power plant now installed which has been so planned that practically all of the power can be developed as needed by the installation of more machinery and additions to the present plant. The investment of the Hanford company in power plant, pumping station at Coyote Rapids and ditches to irrigate their lands is more than one million dollars, of which the power and pumping plants represent much the larger part.

The Hanford improvement is described in a pamphlet on "Irrigation in the State of Washington"

The Priest Rapids Power Plant.

issued by the United States Department of Agriculture, as follows:

"The power canal is 10,275 feet long with a weir across a narrow channel in the river which connects it with an island, making in effect a wing dam about 3,000 feet long. The canal below the weir, for a distance of 7,000 feet, follows a natural rock channel having a width at low water averaging 500 feet and at high water 1,000 to 1,200 feet. Below this point it is excavated to a bottom width of 67 feet and a top width at high water line of 133 feet. The material taken from the excavation, consisting of earth, gravel and rock, is placed in the embankment between the canal line and the river.



Interior of Priest Rapids Power Plant.

"The power house is built of re-inforced concrete complete for two power units and one exciter unit. It is 67.5 by 70 feet and about 90 feet high above foundations. This power house may be extended down stream a distance of 2,000 feet along the gravel bench which would carry the power canal. The turbo-generator unit already installed furnishes power in excess of the amount required to operate the pumps. The pumping station is of reinforced concrete built to accommodate four motors and pumps with lightning arrestors and transformers, bilge pumps and full equipment of instruments. The two synchronous motors and pumps already installed and in operation are of the vertical, centrifugal type, carrying the motor directly connected to the shaft. The speed of the motors is synchronous with the generator and the column of water pumped is controlled accurately by regulating the speed of the turbines. Their nominal capacity is 64 cubic feet per second each at a speed of 175 revolutions per minute. Their combined capacity is 83,000,000 gallons per day, a sufficient quantity to irrigate 16,000 acres."

The transmission line which conveys the power from the power house at Priest Rapids to the pumping station at Coyote Rapids is 16.3 miles long, consisting of three No. 4 copper wires and carrying 46,000 volts. The transmission line is now being extended to the town of Hanford, to furnish power for lighting and heating the town, pumping the domestic water supply from the Columbia River, and running other machinery.

The Hanford plant has been in successful operation since April, 1909, and electric power for pumping has proven so satisfactory that there is an insistent demand on the company to furnish power for numerous small pumping plants along the river, operated to irrigate a few acres each. These plants, operated by gasoline power or water power, are expensive in operation as compared with electricity and not as dependable under non-expert management. Accordingly, the power of the Hanford company is demanded.

The success of the Hanford company will doubtless give an impetus to the development of the electrical energy of Columbia River water power and make the Columbia River Valley the scene of great activity in that line.

DAMAGE CLAIMS—A MODERN VIEW.[1]

BY JOHN P. COGHLAN.

Damage claims, no matter in what industry they arise, naturally divide themselves into two classes—those arising from injuries to property and those arising from injuries to persons. Injuries to property are easily disposed of; they involve only the damage or destruction of what has been or can be produced with money, and are satisfied when the loss inflicted is measured and paid for according to market standards.

Coyote Rapids Pumping Station

Irrigating Ditches

Personal injuries, on the other hand, involve all the human elements—the home, the relation of the individual to society, often life itself. Their causes and effects are as complex as our modern industrial conditions, and, like those conditions, are constantly in a state of evolution.

Interior of Coyote Rapids Pumping Station

Canal Head

No one, perhaps, is more affected than the employer, for of all personal injuries, as he knows them, more than four-fifths occur to workmen in the line of their employment. Yet the employer seems to be the last to observe the change that is going on. Except in rare instances he clings to the point of view of years ago; he still sees the relation between himself and his employe as those before him saw it in the days of the stage coach and the hand press.

This is largely due to the fact that in the beginning the law circumscribed both the employer and the employe. It assumed, because the employer purchased labor and the employe sold it, that the relationship between them was one of implied contract. As incidental to that contract it reasoned, that, as the employer selected the place of employment, it was his duty to make it reasonably safe, and that as the workman chose to enter the trade or industry in which the employer was engaged, he assumed its ordinary risks and hazards. One of these ordinary risks and hazards was the negligence of fellow servants. The idea of the law was that the negligence of fellow servants was the master and servant were close to each other and as likely to be known to the workmen as to his employer and that if he did not want to assume that, and the other risks of his calling, he could leave and seek employment elsewhere. Moreover, it was believed that both the ordinary risk of the employment and the negligence of fellow servants were perils that could be provided for in the rate of compensation.

[1] Paper read before the Pacific Coast Gas Association, San Francisco, September 21, 22, 23, 1909.

This doctrine was the outgrowth of a time when when most manufacturing was done by hand or with simple machinery. At that, it is not old as time is ordinarily measured. The first case involving damages to an employe to get into court, was decided in England in 1837. It was a case growing out of injuries received in the overturning of a stage coach. The principles there laid down were brought over to this country, and, first in South Carolina, and then in Massachusetts, applied to American conditions. In the Massachusetts case, Farwell vs. the Boston and Worcester Railway Company, great stress was laid upon the rule that the employe assumes the risk of his employment and the negligence of his fellow servants. It projected a line of reasoning that was soon adopted by all the courts of the United States. As time passed the doctrine, instead of advancing, was being continually carried back to the first case, the lawyers and judges of the country looking behind for precedent, rather than ahead for progress and development.

Meanwhile the status of the employe changed rapidly. From a condition in which he worked under the master's eye and often at his side, he passed into a state in which he became but a part of a great machine. Instead of working with a few men, generally less than a dozen, he found himself one of many hundreds. For fellow servants he frequently had men he never saw or even heard of, many of them miles away. He had nothing to do with their employment, and knew nothing of their skill or want of it. Yet when injury befell him he found that he was regarded in the same light as when he worked with his hands and as the personal servant of his master. He learned that perhaps a superintendent or manager he had always considered in another sphere was his fellow servant, and that the mistake of that superintendent or manager was one of the risks he had assumed when he accepted employment. Or, perhaps he found that he had assumed a hazard that came from the breaking of an immense machine, that he neither set up nor operated.

When he came to a realization of his position, the workman's first effort was to shift more of the burden to the employer. His idea was that he would be relieved if he could put the negligence of his fellow servants and the risk of the employment upon his master. With that end in view, he began to influence legislation and in a short time succeeded in England in having the risk of the employment transferred to the employer, and the fellow servant rule so altered as to exclude from it managers and superintendents and finally all employes engaged in different departments of labor than himself.

From England this modification, like the original doctrine, traveled to this country. It was adopted in Alabama in 1885 and in Massachusetts in 1887. Since then, it has been accepted with some minor changes in twenty-eight States. Colorado has abolished the fellow servant rule entirely. California has excluded from it all agents or officers superior to the employe injured, and all employes engaged in other departments of labor. It has furthermore provided that knowledge of the defective or unsafe character of machinery or appliances used in his trade shall not bind the employe unless it appear that he "fully understood, comprehended and appreciated the dangers incident to the use" of such defective or unsafe machinery or appliances.

This change in the relation of the employer to his employe was quite radical, but it did not establish any new basis of liability. It was merely taking the common law as it stood and, declaring that when an injury happened through the hazards of the employment or the negligence of fellow servants, it was more fair that the employer should bear the loss than the employe. While it removed some of the burden from the workman it did not give him a new or more humane method of compensation.

The law-makers of England saw this very early, and looked about for a better plan. They found it in Germany and other countries of Continental Europe, in a system which provided compensation regardless of how the injury occurred. It was a system that differed essentially from anything England had known in that it disregarded entirely the old common law principle of liability. It treated injuries to workmen as an incident to industry, and kept the burden of those injuries off both the workmen and the employer, placing it upon the trade in which both were engaged.

This system England adopted in 1897, and widely expanded in 1900 and 1906 As finally put into effect it provided a definite compensation for injuries of every character. To the employe temporarily incapacitated it furnished half pay; in case of death it allowed his dependents a sum equal to three times his annual earnings. The compensation was provided no matter how the injury occurred, whether by the workman's own fault, unless it be by his "willful misconduct, or by the fault of the employer, or by nobody's fault.

The English act departed from the German, however, in one important point. It compelled the employer to provide the compensation. The Germans made the compensation payable out of an insurance fund maintained about equally between the employer and the employe. They reasoned that both would take it out of the industry in which they were engaged—the workman by obtaining a wage high enough to include the premium to the insurance fund and the employer by adding his proportion to the cost of production.

The English went at it more bluntly. They put the expense bodily upon the employer to let him add it to the cost of his commodities and so pass it on to the customer. Both systems have the same effect, however—that is, to diffuse the shock of accidents: to take it from the weakest part of the community and put it on the public as a whole. The distinction is one of method; the Germans accomplishing the result by compulsory insurance, the English by compulsory compensation.

The German system goes beyond the English in that it furnishes compensation in case of sickness. Its provision for sickness is separate, however, from its compensation for accidents, but, like the latter, is paid from a fund provided jointly by the employer and the employe.

So complete is the German system that each year compensation is awarded to something like 150,000 employes injured during the year, and to some 600,000 injured in previous years, and still totally or partially disabled. In addition, compensation is awarded yearly

to some 65,000 widows and 100,000 children of dead accident victims. It is estimated that about eighteen million workmen are protected by this form of compensation against the consequences of industrial accidents. About two and seven-tenths per cent of the wages paid by the Krupp Company goes into this insurance every year, of which nearly two per cent is paid into an accident and over seven-tenths per cent into a sick fund.

The compensation plan has within a few years passed over all Europe. It has been adopted in every country on the Continent and even in Australia, New Zealand, British Columbia and the Cape of Good Hope. In one form or another it is now in effect in twenty-one countries. It is only a matter of a short time, I believe, when it will be generally followed in the United States. In fact, the Federal Government has already put it into operation in favor of its own employes. Massachusetts, Indiana and other States are on the verge of adopting it.

In Indiana the scheme is even now under consideration by a special commission. As in England, this commission proposes that a sum equal to the earnings of three years be paid in cases of death, and that medical expense and at least half wages be paid in all cases of disability. Unlike the English, but according to the German plan, it is proposed that the employer and the employe both contribute to the fund from which it is intended the payments shall be made. It is to be compulsory upon the employer that he provide at least one-half the fund. To insure proper management it is proposed to place the fund under State control. In all cases payments are to be made irrespective of the fault or negligence of the employe.

It is interesting to note that the development of this problem has been along the same lines in this country as in England. In the beginning both placed the risk of the employment and the negligence of the fellow servant upon the workman; then both shifted these burdens to the employer; then England adopted the plan of compensating for injury regardless of the fault or lack of it on the part of the employe, and now this country is accepting that policy—in fact, has already adopted it in so far as the employes of the National Government are concerned.

Independent of official action, employers with advanced ideas here and there throughout the United States are providing compensation plans on their own account. In some instances a sort of joint insurance has been adopted to which the employer and employe both contribute. In others the plan has taken the form of a fund established by the employer out of premiums formerly paid casualty insurance companies. In each instance the effort has been to provide the injured with hospital and medical care; half or full pay during disability; often a pension for total incapacity, and not infrequently in cases of death an allowance to dependents equal to the earnings of the deceased for one, two or three years.

The employers who are doing this are far-sighted and constructive. They are not only preparing themselves and the industries in which they are engaged for a condition that is rapidly coming upon them, but are adopting early the most scientific and humane plan yet proposed for dealing with this problem.

Wherever adopted the plan of compensation has given general satisfaction. It has proven the most equitable system that has so far been devised. It has in it elemental justice in that it compels each industry to bear its own cost in human life as well as in the wear and tear of machinery—a cost which in time will be so adjusted that it will fall upon the consumer and not upon the individual worker and his family, or even upon the individual employer.

Moreover, the adoption of this system has a tendency to develop safety appliances. It brings a fixed expense to every industry and the effort to reduce that expense results in new methods for preventing injuries. It makes it profitable to think up new ways of avoiding accidents. Indirectly it emphasizes what the Germans learned long ago, that "every life saved is a national asset."

It is said that a half million persons are killed and injured in industrial work in the United States each year. In 1905 more were killed and injured than on both sides of the Boer war in three years. About half the casualties in any industry occur to men under forty years of age—that is, during the best period of their industrial lives.

These figures show how near this question comes to the people. It is ever before them and with all the human interest that attends upon life and death. It is well, therefore, for the employer to stimulate his point of view to look ahead and prepare for the future. The doctrine of liability is dying; it is giving away to a plan which compensates whether the injury is the result of the workman's fault or not. It is going out before a day which holds that as the Government compensates its injured soldier for his services to the Government, so must the industry compensate its injured workman for his services to industry.

NEW BUSINESS METHODS.[1]

BY T. D. PETCH.

Before proceeding with the subject of this paper, I desire to call the attention of the association to the interesting fact, that this year, 1909, is practically the one hundredth anniversary of the application of F. A. Winsor for a franchise or charter, from the British Government, for articles of incorporation for the chartered Gas Company of London, which company not only enjoys the distinction of being the first company incorporated, but is today, I think, the largest gas company in the world, known as the Gas Light & Coke Co. of London, England.

Winsor was bitterly opposed before Parliament by William Murdock, to whom undoubtedly belongs the honor of the first application of coal gas for lighting purposes. As early as 1792 Murdock began experimenting with the different kinds of coal, wood and other substances, by destructive distillation, for the purpose of making gas, and in 1797 built and operated the first gas works, with which he lit his own premises. With this brief mention of the early history of our industry, I will pass to the subject of this paper.

A few years ago the writer was, and had been for some years past, manager for a company operating both the gas and electrical departments of the lighting business, in a town of 12,000 inhabitants. The lighting of

[1] Paper read before the Pacific Coast Gas Association, San Francisco, September 21, 22, 23, 1909.

the entire town had gone over to electric, and it seemed as if the gas department had outlived its usefulness. With gas selling at $3 per thousand, and wood for $2.00 a wagon load, the annual output was 3,000,000 cu. ft. About this time crude oil had commenced to be produced in the southern end of this State and oil gas generators had begun to take the place of coal gas retorts.

I was fortunate in having as president of our company, a man who understood the business, he was thoroughly progressive, and not afraid to spend money for improvements, if he thought it would bring results. After taking the matter into consideration, an oil gas generator was installed, the price of gas reduced to $2, a small stock of gas ranges, water heaters, and other kinds of appliances were put on sale by the company, with indifferent results. Six months later the methods that increased our sales, in a little over two years, from three to eighteen millions were put in force.

The price was again reduced to $1.50 per thousand, base rate, but in reality to $1.00 per thousand, and I can assure you that such a radical measure was not adopted without some fear of what the result might be. I believed then, as I do now, that the $1.00 mark must be reached by any company, before the maximum of sales can be attained. But to explain what I meant in reality by $1.00 gas; we advertised that the rate for gas had been reduced to $1.50 per thousand, but any customer paying $3.00 or over per month, would be charged at the rate of $1.00 instead of $1.50.

As we expected it very often happened under this arrangement, that two people would pay the same amount, $3.00, one for two thousand, the other for three thousand. We were particular to explain to the customer paying the $1.50 rate for 2000 ft., that he could have used 1000 ft. more, with no extra cost to him, and in nearly every case we found our customer the next month, had used between three and four thousand ft., and was pleased that he did not need to study close economy in the use of his appliances.

The next move was to purchase 50 of the cheapest good gas ranges, as well as to stock up our appliance department with an up-to-date supply of ranges, water heaters, radiators, tailor irons, toasters, nursery burners, in fact anything in the appliance line that we thought might be called for by our customers.

At this time, as far as we were able to ascertain, there were only twenty fuel gas appliances in the town connected, and we came to the conclusion that if we succeeded in increasing our gas sales, something out of the ordinary must be done to induce people to use gas for fuel purposes. So we inserted an ad. in the daily papers to the effect that to the first 50 people applying at our office and agreeing to use $2.00 worth of gas per month for the period of one year, we would, at our expense, connect up a new gas range in their kitchen, ready for use, absolutely free of cost to the party signing the agreement. In ten days every one of the 50 stoves were signed for, and we could have had as many more. It is worthy of note, that for the signed for period of one year, only four of these free stoves were removed, and every one of them eventually paid the $1.00 rate, using 3000 ft. per month at least. As an advertising medium these free stoves brought quicker and better results, than anything in the advertising line I have ever tried.

Our appliance department was placed in charge of a lady demonstrator; a salesman and solicitor was sent out to make a house to house canvas of the town. And to the zealous and enthusiastic work of these two, I attribute the sale of nearly two thousand appliances in two years. In every case after the first 50 stoves were set, all appliances were sold at cost, with free service and connection, besides running a little over eight miles of main.

I have not attempted to go into close details, but have given the main points only, which brought about in a small town, a large increase in gas sales, in a comparative short time, under the conditions stated; which may perhaps be considered out of the ordinary. With your permission I will now consider the methods employed quite recently in another 12,000 population town, existing conditions about average, for a Californian small city.

Early in the winter it was decided to make an effort for new gas business, the following summer. The first thing done was to send out a reliable man, with instructions to carefully note each house, by street and number, located on the company's mains, segregated in three divisions. The first division to give the existing consumers; the second, premises having service but not being used, designated as dead services; the third, premises not connected by service, and called non-consumers. This data was then transferred to a "Sanborn" map, on which had previously been placed the entire under-ground system of the company in different colors, representing different size mains. Each service was then ruled in from the main to the meter in red ink, regardless of whether it was in use or not, but in the case of a dead service a light pencil line was traced from the property line to the front of the house, showing that the service was not in use; whenever these idle services become active, the pencil line is easily erased. Next, typewritten copies of all dead services and non-consumers, were carefully made, by street and number, ready for the solicitor. The same record was obtained of every street and house in that portion of the city not covered by mains, these in turn were listed on type written copies, ready for future use.

With this record before us, we were in a position to go after new business in a systematic manner, taking up any street in any portion of the city, whenever we thought it could be worked to the best advantage. The next step was to buy out the stock of the three firms carrying gas appliances, and fit up in our office an attractive display of ranges, water heaters, etc., connected and ready for demonstration, particular attention being given to the window display, making it as attractive as possible with a collection of the best class of ranges and heaters, with a few of the smaller appliances, such as hot-plates, waffle irons, etc., not too closely crowded together, but arranged to give the best effect. The window was left well lighted until 10:30 p. m. The writer usually returned to the office about 7 o'clock in the evening until 9:30 and sometimes later. Judging from the number of people who stopped

and looked at the appliances, as well as those who came into the office to make inquiry, it was a success.

Much depends on the man employed as a solicitor, the position is often hard to fill, requiring as it does, a thorough knowledge of the apparatus to be sold; ability, natural not assumed politeness, an all round genial disposition, and the energy and staying qualities of a 10 h. p. gas engine. Add to the above description a firm belief that gas is the only fuel on earth fit to use, and you have a true portrait of the one selected from among the employes of the company to do the soliciting. In addition to his regular salary as inspector and trouble man, he was paid 50c for each appliance sold or connected, for a new consumer, and an additional $5 if 50 appliances were set in the current month.

Having been given the street data, previously prepared he commenced to work that portion of the city in which we had no mains laid, and for three months and a half, kept a crew of twenty men busy laying mains, putting in services, and setting appliances and meters. A month later a lady instructor and demonstrator was sent out to follow up the work of the solicitor. This comparatively new addition to the gas company's force, in my opinion should always be a woman. If she is thoroughly qualified to fill the position, she can do more to bring about a friendly relation between the company and its patrons, than any other means that can be employed.

To be effective she must possess all the qualifications and abilities of the successful solicitor, must understand and be able to regulate all kinds of gas appliances, be familiar with the correct method of setting ranges and water heaters, know the moment she handles the range its condition, if the pressure is good or bad, she must be an excellent cook, be possessed with patience and tact to a marked degree, she must be a perfect lady, the more refined the better, at home in the parlor or kitchen, of good business ability, a pleasant and persuasive talker; her business is with the lady of the house, the one who does the cooking, the one that puts up with a hot dirty coal or wood range, or enjoys the cool clean health and comfort of the gas range.

Our instructor, in the course of eight weeks, made a house to house canvas of the town, interviewing, and instructing whenever necessary, in the economical use of the range. Listened to complaints, in some cases rectifying them, and in others returning them to the office, to the complaint man and fitter. She also gathered together the complete data for a consumer's card record, showing the name, street, and number of the house, of both consumers and non-consumers. In the case of consumers, the appliances in use were noted on the card, together with anything of interest, such as, prospect later for a water heater, or if the card recorded a hot-plate in use, talked purchase of a range, party interested, follow up with literature and call later. Non-consumers are noted in the same manner.

The size of the meter and service will eventually be recorded on the cards, which, when filled out, will be a complete record of the consumers service from the main to the appliances in use, as well as a good guide to future new business.

The usual means of advertising in the daily papers was carried on, the ads being changed as often as necessary, as well as special cards and posters being displayed in the windows and office. The two gas wagons, as well as the electric department wagon, were made to serve the purpose of a traveling advertisement. All three wagons were sent to the paint shop and lettered on one side "Cook with gas," on the other "Ranges at cost, service and connection free." The name of the company and office number appeared on the end gate. As these wagons were going all day, the lettering on them attracted more or less attention all over the town.

Another and the most expensive method of advertising was the cooking school demonstrations, consisting of a series of six lectures on scientific and practical cooking with a gas range. A large vacant store room was fitted up for the purpose, and from the first to the last lecture, it was hardly possible to get standing room. Seats were provided for 250. The two ladies who gave the lectures were certainly past-masters in the art of cooking and ability to lecture on the subject. I am, however, of the opinion that this method, on account of the expense, is better adapted to larger cities than ours.

Another and not to be overlooked factor in getting new business, is the office force. The treatment afforded the public at the counter, helps or retards every effort made for new business. I would like to note at this point that new business is not confined to new consumers, but to the old as well. When consumers have been supplied with what we have termed a gas equipment, consisting of a range, water heater and toaster, and the coal stove out of commission, then only can you let your consumers alone. Don't bore them, but remind them occasionally that they need the appliance they have not got. It is imperative that the public be educated in the use of all kinds of gas burning devices, if we are to get the best results. The office force can, by pleasant, courteous, obliging treatment, do much to bring about the desired end, and the reverse, according to the manner they treat people making inquiry or paying bills at the counter.

All of the methods mentioned have proved more or less good aids in procuring new business, in the experience of the writer, who is himself perhaps an enthusiast in his belief that gas is the fuel of the people, at least of this State; and all we have to do as manufacturers and sellers of gas, is to educate them to the fact, that gas is the cheapest and best fuel to use from every standpoint. Then, and not till then, will the maximum sales be reached.

In the course of an address delivered by M. T. Bogert, while president of the American Chemical Society, he stated: "In the United States the average thickness of locomotive boiler scale is one-sixteenth of an inch. This means a loss of at least thirteen per cent in fuel efficiency; for an eight-inch scale this amounts to twenty-five per cent, and for a half-inch sixty per cent. Taking one-sixteenth inch, then, as the average boiler scale, this means for our fifty-one thousand locomotives alone, a total annual loss which may be estimated conservatively at fifteen million tons of coal. The use of properly treated water in the boilers reduces the coal consumption and, by decreasing the amount of repairs and prolonging the life of the boiler, reduces also the demand for iron."

A GAS EXPOSITION AS A MEANS OF ADVERTISING.[1]

BY JOHN D. KUSTER.

It was suggested by the general manager that each of the district managers of the Pacific Gas & Electric Company do something in the nature of educational work, consequently a cooking school was determined on for the Fresno district and an appropriation of $300 was granted covering expense of same, as an experiment for a week.

Realizing that a cooking school without an exhibition of gas appliances would be but a partial success, an effort was made to get the local hardware men interested in the scheme. Their co-operation was not hard to get as the gas company had, a year previously, turned over to them entirely, the handling of appliances, with the single exception of gas arcs. Meetings were held in the gas company's office and a committee selected to arrange all details.

A vacant hall, 140 ft. long by 26 ft. wide was secured. This was spaced off into booths about 8 ft. by 20 ft. and space selected by drawing lots. The exhibitions were given the front portion of the hall while the rear 60 ft. was retained for seating our guests. Between the auditorium and the exhibition, a raised platform about 10 ft. square was erected for the use of the demonstrator and lecturer, who by the way was Miss Suzanne Tracy of San Francisco. An aisle eight feet wide was left throughout the entire center of the hall, but during the lecture it was found necessary to arrange seats on each side as our meetings were more popular than we had hoped. This arrangement of the hall was the best to be had under the circumstances, but the ideal plan would be to secure two halls adjoining, and opening into each other, one for the exhibits and the other for the lecture room, so arranged that visitors must pass through the exhibit to the auditorium. This arrangement permits exhibitors to show their appliances without disturbing the lecturer or her audience.

A loop of 1½-inch pipe was laid against the walls, with tees every ten feet and connected to two services, insuring a perfect supply of gas for all purposes.

The newspaper advertising was ably conducted by a local advertising agency and consisted of extra space for the initial announcements a few days in advance of the opening day, and star locals and special write-ups after school opened. A city election of more than ordinary importance was to be held on Monday, the day preceding our opening day. Realizing that few advertisements would appear, we decided to invite all the appliance men to join with us and make an extra effort to cluster our advertisements on this day. Consequently, the gas company occupied the center of the page and the appliance men secured the space surrounding it. This gave the exposition special prominence. Individual invitations were not sent out, but window cards were placed in prominent windows, a large banner was placed over the entrance to the exposition, invitations were sent to the high school, and hundreds were specially invited by employes of the gas company and appliance firms.

In this connection it would be an easy matter to give the exposition wide publicity through the numerous women's clubs. There are many ways in which the news that a cooking school is in progress can be made to travel rapidly for most women are deeply interested in good things to eat, and are anxious to know how to prepare them. Let it be known what the program for each day is to be; what days will be devoted to pastry and salads, or for roasting and boiling, or for baking bread and cakes. Announce that certain days are to be given to the attention of requests from our guests. Appeal to the nurses of the city and give instructions on "How and What to Cook for the Sick Room," or some little catchy idea might attract attention and get the women to talking over the garden fence or at their card parties, as for instance, announce that you are going to show them that a large cake of ice may be put into a gas range so as to reduce the temperature as near the freezing point as possible. The temperature will be taken and the time noted. You will then light the oven and in seven minutes you will turn out the finest biscuits to be had in town.

A day should be set aside occasionally for special instruction of servant girls, not the girls who superintend, but those who do the actual cooking. Make these lectures cover everything pertaining to the kitchen and dining room; how to keep the range clean and sanitary; how to properly light the burners and adjust them so as to get the proper combustion and heat, and at the same time how to economize in the use of gas; how to prepare a four or five course dinner or a small luncheon and what is almost as important, how to serve it after it is prepared. Many of the servant girls would be compelled to attend and they would soon become interested and attend from choice. These very servant girls, many of them, are destined some day to become the wives of mechanics and artisans—the men with moderate incomes, who are the larger and most desirable proportion of our consumers, whose wives do their own housework. The woman who does her own work, if given a chance to exercise her choice, will use gas.

The selection of a range for demonstration work will give you some concern, for each exhibitor will grieve when his range is not before the public. This is where the lecturer must use her tact and treat all gas ranges alike, giving preference only to the cabinet ranges, which should always be selected. I suggest a cabinet range because the human race in general are imitators and the comfort and ease of cooking on such a range is brought forcibly to the attention of everyone—the usefulness of the oven and broiler are so obvious that the frying pan will soon be relegated to the junk pile. I believe special inducements should be held out by gas companies to prospective consumers to induce them to use cabinet ranges.

In our educational work we should make haste slowly. Do not attempt too much. Gas men are busy men and are usually rushing about and become impatient if the world about them appears to be more deliberate.

Three lectures a week will accomplish greater results than six. The many details of preparation must be in a large measure looked after in person by

[1] Paper read before the Pacific Coast Gas Association, San Francisco, September 21, 22, 23, 1909.

the lecturer. The successful lecturer must be of a nervous temperament, and full of vim to hold the attention of 300 or 400 other women for an hour and a half, and if you will drop in half an hour after the close of the lecture you will find 25 women still pouring out their troubles. The sweet sunny disposition of the successful demonstrator can be kept up only by having plenty of time for recreation.

The manager holding the exposition should attend all the lectures and stay to the finish. He should be there with the welcoming handshake and it would not hurt him to give a five minute talk each day. I believe it pays to do these things. Each guest should be presented with some souvenir, something cheap, but novel, but of such a character that she would take it home. Small folders containing some of the best recipes used by the lecturer and some of her slogans on gas economy should be distributed. One page might contain the program and dates of the lecture course.

In large cities this work should be carried on constantly throughout the year. In small cities from a week to three or four weeks each year might cover the field. Results may not appear as soon as you hope for, and the appliance men may not have placed as many orders as you expected, but you may rest assured that some of the seed sown has not fallen upon the rocks. The stimulant your efforts might have had on each local dealer has been worth while. Each appliance man is confronted with the fact that his line is compared with every other line in town, and his natural pride will compel him to put on a good exhibit and carry a full line in stock. The dealers learn something of the selling points of their own lines, and also how to put up and regulate the heaters and ranges, special salesmen will come in from the branch wholesale houses. Few of the local dealers have given enough attention to the gas range to even know how to light the oven, and when it comes to adjustment, they are thoroughly at sea.

Special salesmen came from San Francisco, Oakland, Berkeley, Los Angeles and Portland to visit our gas exposition at Fresno and they were mighty welcome too. There seems to be a sort of wireless telegraphy that keeps them advised of what is doing. When the local dealers are driven by business rivalry to make a good display, they naturally begin to sit up and take notice, and gradually absorb some of the enthusiasm of the demonstrator and special salesman, and before he himself realizes it, he has become a live wire.

Your guests who have been instructed and entertained and have become acquainted with a few pleasant people, who go to their homes feeling better toward the gas company. Few can resist that impelling force—sincerity—and they soon see that enthusiasm and sincerity with a knowledge of the business is the ammunition the representatives of the company work with.

I do not know what is being done in the state toward teaching of domestic science in the public schools, but it should be some one's business to find out and see to it that such a course was started in every city and that the class room was equipped with the most modern appliances, and then carry it a step farther if possible, see that this course was made compulsory—boys and girls alike—but given such prominence that the work would be dignified and popular.

Demonstration work is merely a plan of education. The newspaper man would call it advertising, which perhaps it is, but it is judicious advertising, enthusiastic advertising—advertising for a purpose—and that purpose broadens its scope according to the thought and intelligence and ginger put into it.

We must learn to do something more than have our cards in the papers. There is nothing unethical about letting the people know that while our product is invisible, yet it has the power to do great work; that its uses have increased with wonderful rapidity during the past ten years, and we are large enough to believe that the coming generations have deep hidden secrets yet to unfold. The load factor is yet far from the 100 per cent ideal, and the speed with which we approach that ideal will be determined largely by the educational team work we do, and in that team work the gas exposition plays a most important part.

PROCEEDINGS OF THE SEVENTEENTH ANNUAL CONVENTION OF THE PACIFIC COAST GAS ASSOCIATION, HELD AT 445 SUTTER STREET, SAN FRANCISCO, CAL.

TUESDAY, 10 A. M., SEPTEMBER 21, 1909.

The Convention was called to order, Vice-President W. B. Cline occupying the chair. Communications were read from President George S. Colquhoun, Secretary John A. Britton and C. O. G. Miller.

The Secretary: Last May Mr. John A. Britton received from Mr. Cunningham, of the American Gaslight Journal, a request to write an article on the gas industry of the Pacific Coast, and offering to pay for such an article the sum of one hundred dollars. This has been received and credited to the library fund of the association, as desired.

The Chairman: If there is no objection the communications will all be received and filed. The next order of business is the report of the secretary-treasurer. [Read and approved, as was also report of directors.]

The motion that the secretary cast the ballot that the Eighteenth Annual Convention of the Pacific Coast Gas Association be held in Los Angeles, Cal., in 1910, was put and carried. After the election of new members the secretary read memorials of deceased members and the report of the librarian.

The Chairman: Gentlemen, I will announce the committee to nominate officers for the ensuing year: E. C. Jones, John Worry and J. S. Kaneen.

The president's address was then read by Chairman Cline as printed in the Journal of Electricity, Power and Gas of September 25, 1909.

Discussion on "Public Benefits Derived from Water Power Development in California."

J. M. Berkeley: Mr. President, while I am a little bit late in rising, I don't like to see such a good thing as that go by without saying something about it. I believe that if convention papers were written with the idea that this paper was written, viz: to give stated facts in conservative and sensible terms, that men attending conventions would go home with a better understanding of public utility service corporations, and would be better able to cope with the financial conditions that are presented to us, and in addition to that would be intelligently able to put up an argument, or refute arguments that really have no bearing. I appreciate very much the intelligence and the expression of facts that Mr. Martin puts up so well, because it is an educator.

Mr. Webber: I believe, if it be possible, that paper should be published in the leading newspapers of San Francisco, or of the United States, by popular subscription, if it cannot be done otherwise.

[1] Journal of Electricity, Power and Gas, Oct. 2, 1909.

Mr. Martin. Every Congressman and every United States Senator will receive a copy, and, in fact, all the newspapers of this State. That is provided for.

Discussion on "The Emergency Service of the Los Angeles Gas and Electric Corporation."[1]

Mr. Leach: I believe we all owe a debt of gratitude, not only to the gentleman who has read the paper on this excellent organization, but also to the company which has been the pioneer in such an efficient organization. All of us that have any responsibility in connection with a gas company appreciate the very dangerous commodity which we deliver into the homes of our customers. It is seldom that any of the successful gas companies have the unfortunate experience of cutting off their entire service, so that the possibility of damage really started in a very insignificant way, as it was touched on by the writer of the paper. Frequently, the most insignificant report of the odor of gas turns out to be a very very dangerous problem, and I believe that, while all of us cannot maintain such an elaborate organization as has been set forth in this paper, at the same time we should give the most serious consideration to an organization, for the immediate attention to even the report of the smell of gas; and, while in the territory that I have charge of we have not an organization such as has been spoken of, at the same time we have found the use of automobiles extremely useful in the transportation of men to the different points of trouble, and in the prompt action and the saving of property from damage.

Mr. Jones: I believe the work done by Mr. Vance is a step in the right direction. It seems to me that the automobile as a means of getting men quickly to places of emergency has not been fully appreciated. I think one of the most ludicrous things to my mind in these days of rapid transit is to see a team of fire horses developing their energy up and down. The more you drive a fire horse to a fire the more he acts like a rocking-horse. There is a great deal of motion but no great headway.

The Chairman: Lost motion.

Mr. Jones: And a team of fine horses on a fire engine in San Francisco doing its very best will be passed by the simplest of the cheap automobiles; and it seems to me that the work done by Mr. Vance should be copied by municipalities in getting their apparatus to fires, to do away with the danger of loss of engines, where engines are hauled in too close proximity to a fire and allowed to burn up because horses cannot be taken in to pull them out again. If we had automobile fire engines we would be able to save our engines; they would not burn up with the buildings. I believe that gas companies should devote their time, money and attention to taking care of complaints of leaks and stoppages, and the automobile solves the problem in saving time.

Discussion on "Some Results of Personal Interviews with the Dissatisfied Consumer."[2]

Mr. Boyle: My experience has been in line with that of Mr. Clements. I have found that the most satisfactory results are obtained where complaints are made, by having our people meet the complaining man or party and have an examination made of their stove or their fixtures and an explanation made to him of the cause of the trouble, at the same time rectifying it. In this way a little good feeling is created toward the company.

William Schade: Mr. President, I don't believe anybody appreciates the paper which has just been read more than I do in my position as city gas inspector of Los Angeles, and I will relate a little incident that occurred three weeks ago. A young man came to my office and complained that his gas bill had jumped from eighty-five cents to a dollar and sixty-five cents, and there must be something wrong. I explained to him the movement of the meter and the way it recorded, and assured him I would take the matter up immediately and attend to it at once. He said: "Well, you better not go right away because the company has not read the meter yet; I read it myself, and maybe I read it wrong." He has not come back since. Now, the meter was to have been read within a day. He came in the day before the meter was to have been read, and he said he would let me know after the company read it. This was three weeks ago, and he has not come back since.

Mr. Parker: In the discussion of a similar paper at New Orleans recently, at the meeting of the Southern Gas Association, Mr. Miller, the manager of the gas company, told of a complaint of a lady who brought in a bill of $2.50 for the breaking of wine glasses. The clerk wanted to know what the company had to do with the breaking of wine glasses. She said a man came out to the house to install a gas range, and, in boring a hole through the kitchen floor he left the hole open during the night, and a rat came through the hole and got into the china closet and broke some wine glasses, and the damage she thought would be about $2.50, and she wished the gas company to pay it. The clerk said: "How do you know the rats broke them?" She said: "I saw where the rats had been in the closet." So they paid the bill.

Discussion on "A Word About Gas Collections."[1]

Mr. Leach: I think, Mr. President, there is one point there that cannot be too strongly emphasized, and that is the fact that no quarter should be given to dead beats. A few years ago I had occasion to reorganize our collection department, and I had had my eye for some time on a young man who had been collecting for a coal firm; he had collected bills from me before, and he went to work for the gas company; up to that time I had seen his way of collecting and the determination he had in a nice polite way, but there was no getting away from him, which made me feel if I had to give a man a job for collections he was the man I wanted. After he took charge of our work every once in a while he would come any say so-and-so owes twelve dollars, and he is no good; he owed twenty-eight dollars for coal, and it was six months before I got anything out of him at all. So it went on down the line. Finally he came to me one day and said: "I have kept a list of our dead beats, and do you know, 50 per cent of those people owed the coal company I used to work for." And I said: "Yes, I believe if you get the grocer's dead beat list and the butcher's dead beat list and the baker's dead beat list and our dead beat list and you will get them all together; they will not vary 10 per cent." And I say, gentlemen, there is no reason to give a dead beat quarter.

TUESDAY, 2 P. M., SEPTEMBER 21, 1909.

Discussion on "Methods of Education of Consumers."[1]

Mr. Lowe: In the absence of Mr. Baurhyte, I am going to ask you, Mr. Cline, on what basis do you work where you are called upon to pipe a district where the business does not warrant it?

The Chairman: I think, Mr. Lowe, anything within about one hundred and fifty feet of the consumer is the rule.

Mr. Lowe: Small gas companies are in a different position from the great, powerful concerns, such as Mr. Cline represents. I must say I don't believe in the policy of seeking an out and out bonus, but there should be some protection for a company where the business does not warrant the extension. In several of the companies with which I am connected we make a practice of offering to extend the pipes if the consumers will put up the money, and we returning it to them in amounts equal to one-half of their gas bill; that is to say, if the gas bills on the line amounted to $100 per month, the consumers would be paid $50 monthly. In this way the company is saved the original capital expenditure, although it ultimately pays for the entire installation, while the consumer pays nothing, other than that he has advanced temporarily the use of the money for the gas company. I don't see how many of the smaller gas companies can get along without some such an arrangement.

[1]Journal of Electricity, Power and Gas, Oct. 9, 1909.
[2]Journal of Electricity, Power and Gas, Oct. 2, 1909.

[1]Journal of Electricity, Power and Gas, Sept. 25, 1909.

The Chairman: I presume conditions are different in different places.

Mr. Lowe: The cases of Tonopah and Goldfield represent conditions which are rather extreme. Goldfield is a mining camp, and as it may not be permanent, we have offered to pipe the town if they will raise enough money in Goldfield. It calls for a rather large sum, about $75,000, which will require 300 consumers advancing an average of $250. If they will raise the $75,000 in that way they can get an immediate gas supply, whereas the company could not afford to take the risk of the capital expenditure. Even if the town is not permanent, it will at least last long enough for the consumers to have fully returned their advances, and on that basis a company would be warranted in placing the services, meters, etc., at its expense.

The Chairman: I suppose that is a rather extreme case. Tonopah and Goldfield are places whose permanency is very much questioned.

Mr. Lowe: Tonopah is quite safe as the mines there are of a very permanent character, and there should be at least twenty-five or thirty years' life ahead of the town, but the permanency of Goldfield has not yet been demonstrated.

Mr. Leach: In a case where a man comes along and builds a nice home two blocks from the end of your present main, how would you handle him?

The Chairman: We either do it at our own expense or don't do it at all.

Mr. Leach: You don't undertake to do it on such a plan as Mr. Lowe suggests, of allowing him to make advances and returning those advances to him entirely upon different rebate conditions?

The Chairman: No, sir; we have never done it. It might work an occasional hardship upon some individual somewhere, but in your illustration it was a section that was sure to build up in a reasonably short time, and we would strain a point.

Mr. Leach: In some cases you could tell almost to a certainty that it was going to build up, while in other cases there is not that probability, although according to the statements of those interested it is bound to build up immediately. We are accustomed to require an advance only in cases where the immediate revenue is not encouraging. Where it is sufficient to warrant the expenditure no charge is made.

Mr. Lowe: I would like to ask Mr. Adams what his policy is in Stockton in this respect?

Mr. Adams: We charge them for services, and also try as Mr. Lowe does, to get them to pay part of the expenses.

Mr. Douglass: In making the extensions, do you have any basis for calculating how long it would be before the revenue amounts to the amount of your investment? Do you figure on getting your money back in say two, three, four or five years? Do you figure on those lines at all?

Mr. Cline: No, we don't take that into consideration. It is more a question of consumption along the line than getting the money back that is invested.

Mr. Douglass: If anybody wants an extension we charge them for the actual cost of the work and material, and then refund them for each customer we get on that line, and we pay back the money, say within five years.

Mr. Lowe: You don't do it in proportion to the gas consumed?

Mr. Douglass. No, we pro rate it.

Mr. Lowe: If you had a $1,000 expenditure on a line and ten men put up $100 apiece, when would they get the money back?

Mr. Douglass: It would take each consumer on the line five years to get his money back. There would be a pro rate on the line for each consumer.

Mr. Lowe: When do they get it?

Mr. Douglass: As soon as they get a consumer.

Mr. Leach: That would hardly be satisfactory where you make a long extension for one party, the amount paid being more than he would use for a reasonable length of time in gas.

Mr. Lowe: I don't exactly see where the pro rate comes in.

Mr. Membert: We have a system something like that in some cases. Take, for instance, a subdivision where there is absolutely no improvement. John Smith has a piece of property, and he subdivides it, and he wants gas in order to facilitate the sale of his property. He advances the costs for piping that territory. We enter into an agreement with him to refund him say $20 for each consumer that we get for a period of ten years. It may be that he will get all his money back; may be he won't. It all depends. In other words, he takes the risk, and the company supplies the service, he advancing the cost, and it is refunded in each case as soon as the connection is made.

Mr. Lowe: That is not a pro rate. It is a definite amount for each consumer.

Mr. Membert: Yes.

Mr. Z. T. Bell: There is an outlying district which the real estate men are interested in, a district which would not pay for two or three years. I finally piped the district with the understanding that I would refund whatever they used. They paid for the expense of laying the mains, which amounted to something like $4,000 or $5,000. They paid the actual expenses of putting them in; and if they use 1,000 feet of gas a month they get that much refund, and the total value of the gas is whatever they use.

Mr. Lowe: If their bill is $5 they get $5 back?

Mr. Bell: Yes, whatever is collected on that main out there they get it back.

Mr. Lowe: The policy of the companies I am connected with has been to refund the amount advanced at the rate of one-half of the monthly gas bills, and we find the consumers are just as willing to do it. We had a notable instance of this kind in Palo Alto, wherein a real estate concern wished to have a newly opened tract piped, and the cost of which would be approximate $5,000. There were but one or two houses in the district, but they imagined it was going to fill in very rapidly We could not clearly see our way to do it, as there was no promise of a reasonably quick return, so they accepted our proposition, with the result that we are paying them off slowly, as the tract is not developing rapidly; but that is not our fault.

Mr. Bell: That is the same with us, but at the same time we are at no expense.

Mr. Lowe: I rather favor returning advances in one-half of the gas bills, as in that way you are returned the cost of manufacture and distribution, and it seems to me consumers regard it as a reasonable proposition.

T. D. Petch: It appears to me we are living in an age where almost every commodity in life is delivered to the consumer, whether it be the produce of the baker, the butcher, or anything else, and, having given that matter some thought, it seems to me that a gas company, if it expects to realize the full amount of consumption possible, must at its own expense deliver the goods. If, from financial conditions, or any other conditions, the company intends to charge the consumer for the extension, I am of the opinion that it should never be put in the form of a charge for the extension. The company I am connected with now has long ago paid for the extensions such as are under discussion, yet we are confronted with this situation, that the consumer thinks that he owns the main. I believe if a company considers it necessary to charge for the extension, it should be done in the form of having the party agree to take a stipulated amount of gas for the extension, and never allow a consumer to think that he has anything to do with paying for the extension of the main. I think it works an inestimable detriment to the company to do so. I have run up against it constantly, and while I am a firm believer, as is Mr. Cline, that every gas company should carry the gas to the consumer, yet it appears to me if it is done it should be done along some other line than allowing the consumer to think he is paying the company for extending its service and mains to him. That has been my experience. It has created friction, and there is hardly any argument or showing to convince the consumer that they still did not have an interest in the company's property.

Mr. Lowe: We overcome that by borrowing the money

from the consumer outright. He does not have any idea that he owns the main or any part of it. We put it very frankly that the extension will cost a certain sum of money, and that he makes us a loan to cover it and which will be repaid to him in the manner I have stated.

Mr. Hill: My experience is similar to that of the last speaker before Mr. Lowe. We make main extensions where they are sort of rambling out in the woods by saying to the prospective customer: "If you will buy from us a certain amount of gas which is equivalent to the cost of the main extension, we will give you credit on our books for that amount of gas, and when you have consumed that amount of gas we will render you a bill," and we use that as an argument, that that is a mere guarantee to us that they will be constant consumers. If they object, we say: "What guarantee have we that you will consume for more than a month." We find it works very satisfactorily down our way, because if you are talking with a man who really means business, in every instance, as far as our experience is concerned, there is no hesitancy on the part of a *bona fide* proposition for them to put up the money.

Another point, we go one step farther than Mr. Lowe. We don't refund them a cent till they have liquidated the amount; that is, used the gas. If they buy 10,000 feet of gas, or a million feet of gas, unless they put up the coin for that amount of gas they get no coin back. Never. We pay them in gas, and not in money.

Mr. Bell: In that connection, I might say, the way we fixed that in San Bernardino, we sold them so much gas and issued coupons for it, and we charge gas on the books. It was taken up by one or two parties, who solicited the territory, real estate men who owned the principal part of it. We issued to them, I think, something like $4,500 worth of coupons. If they use that gas themselves, all right, they can pay their bills, or anybody else can pay their bills, with those coupons. They don't own the mains. We sold them that much gas and we used their money to lay the mains.

Mr. Lowe: In other words, you got paid for your gas in advance, as Mr. Hill did?

Mr. Bell: Yes, sir; we sold them that amount in coupons.

Mr. Lowe. What do you do when you get that money? What kind of an entry do you make on your books?

Mr. Bell: If they come in and pay cash it is carried separately. They sold as many coupons as they could, and the parties buying the land took so much, and we carried a separate account of it altogether.

Mr. Lowe: I cannot quite see from bookkeeping standpoints the entry you would make on your books. Suppose you would get $1,000 under those circumstances, what do you do with it? I know you would expend it in laying mains, but what I mean is, what entry do you make on the books?

Mr. Bell: I could not explain all that to you. That is the bookkeeper's business

Mr. Lowe: Our method is extremely simple. We simply borrow the money outright and credit the consumer with the sum borrowed. He stands on our books as a creditor, and we liquidate the debt from time to time in monthly payments as stated.

Mr. Berkeley: I believe by whatever name you call it, it is still a bonus, and I believe that in the last analysis it will react on the company accepting a bonus as a part of its business, except possibly in extreme cases, to such as Mr. Lowe refers. I think the intent of Mr. Baurhyte's expression refers to cities of 15,000 and up, and as such I do believe the most disastrous thing a gas company can do is to accept bonuses for a good many reasons. I have been with gas companies who accepted bonuses and know something about it in large cities and towns. A real estate man comes along and says: "I have forty acres of land to plot and I want to lay gas mains through it so that I can sell my lots, and will pay you a certain sum for doing the work." The business agent gets busy; he thinks he is doing a great service by bringing in a sum of money to the company, which gives orders to extend its mains, regardless of the fact that there may be one or five miles laid with no consumers to begin with, the same producing no revenue until there are houses built in the community to make it a paying proposition; that may be one year, or five, or possibly ten. No account is taken at the time of the depreciation of the mains laid in the ground while this territory is growing up to the place where the mains prove a revenue-producing investment.

I contend if it takes ten years to make that investment a paying investment it is not good judgment on the part of the company laying it out, because they have not in the first place received enough money to pay for the investment and the mains have depreciated, which, coupled together with the decrease in value, is greater than the increase in the mileage asset to the company. In addition to this a dissatisfaction arises from individual contributors to the bonus proposition. For instance, a lady comes into the office and says she paid a bonus to have the mains extended to her premises; the gas company turned the mains at an angle on the street, missing her place and thereby not reaching her. To have extended the mains to her would have cost the company at least $150 or $200, and, also, make it available for other non-contributors. She immediately declares she is not getting a square deal from her point of view, and she is right. She immediately sets about with her argument to prove that she has been mistreated and will poison the minds of prospective consumers—going out of her way to hunt up others on the line. This of itself will act as a "boomerang."

I do believe with all my heart that the acceptance of bonuses is the most ruinous policy that can be practiced by gas companies that are big and strong enough to support themselves. I believe every gas company, irrespective of size, should bear its own expenditures. As was said here this morning, a grocer buys his own wagon and merchant does the same, and if we are in the business we ought to be strong enough to be our own carrier and our own deliverer, maintaining the mastery of our own situation. I like Mr. Lowe's suggestion, however, of borrowing the money straight out from the prospective consumer before the extension is to be made. But, under and behind it all, you have got the public sentiment to reckon with as against the corporation, and I do not believe a gas company has a moral, legal or other right to charge John Doe with the gas main. If he lives two blocks away from the company's lines that is not the company's fault. The gas company should not be expected to extend to him their lines to suit his choice of location; if, however, some one builds in between him and the main line, say that 150 feet would apply per consumer to a territory that is growing, then the investment is good. One hundred and fifty feet of ordinary extension of mains will pay on twelve months' consumption, thereby putting it upon a plain, simple basis you deliver the gas—do not ask the consumer to become the carrier for you—do it yourself.

Mr. Lowe: I think you will admit that even the grocery man has a reasonable limit in which he delivers and runs his wagon free.

Mr. Berkeley: So ought the gas company.

Mr. Lowe: What is a reasonable limit?

Mr. Berkeley: As some companies have set it, 150 feet, or an investment of $100, or an investment of $125. Let them set that limit, and stick to that limit, just as Wells Fargo & Co.'s express is run in the city. They say we will deliver to such and such a street and no farther. That is perfectly legitimate. They cannot be blamed because some fellow lives outside of that confine Nor should the gas company be expected because a man lives outside of the limit to extend its mains to him. I agree that in small towns and with small companies, as a general statement, the consensus of what I have said is not always applicable, but I believe the small companies would be better off if they did not assume the burden.

Mr. Lowe: Take the case of a real estate man who wants his tract piped, and who cannot sell lots until the tract is piped; if the gas company refuses to do the work and the owner does not, the tract is not built up, you lose just that much business. What would you do under such circumstances?

Mr. Berkeley: Referring to Los Angeles I think I can answer that practically. I have had the proposition put up to us, just as you state. There are tracts the real estate man wants piped, but on the city side of his tract there still remains open territory on mains previously laid which is rapidly building and becoming revenue producing. As soon as a sufficient number of houses are built to warrant the laying of a main then the company can afford to put its mains there without any bonus and reasonably expect it to become a revenue-producing territory which no doubt would be the case, otherwise it would amount to the gas company assisting the real estate agent more than itself.

Mr. Lowe: That does not seem to answer my question.

Mr. Berkeley: Let them build on the inside. That is an investment of theirs. That is not the company's. Let them build where there is gas.

Mr. Cline: We have had numerous applications made to us where the initial extension involved 500 feet, where we had the assurance that if the main were laid the tract would be at once built up, and we have laid the main. It is surprising what a short time it takes to get a sufficient consumption once you lay the main. In fact, the mere laying of the main builds the tract up, the same as a street car system.

Mr. Lowe: That is exactly the point.

Mr. Cline: I want to urge the benefits to be derived by the companies themselves, through liberal extensions to consumers. I presume the Los Angeles Gas & Electric Corporation this year will lay 150 miles of gas mains. In not one single instance have they accepted five cents bonus for the running of a main or a service pipe, and I think it safe to say the total amount of consumers gained this year in 150 miles of mains will not average over 125 to the consumer. With prospective business it will probably reduce it ultimately to seventy-five feet to the consumer. If we had laid back and said you have got to pay for every block of main and every service pipe, I don't suppose we would have laid fifty miles of mains. I think it pays. The results are astonishing. You may think it a hardship on the company to make extensions, but having once made them it is astonishing how soon you will get sufficient consumption to warrant it.

Mr. Hill: You have used as an illustration the case of Wells Fargo & Co. They do not prohibit their customers from coming and taking the packages from their counters. If we can find customers that are willing to come to our office and practically carry their own gas home in a bag why it does seem to me it is too good business to let go glimmering. I am afraid that these matters, probably after all, must be solved by local conditions—conditions that will require certain treatment in one instance and a certain other treatment in another instance. And, after all, it is a question of policy, and a question that must be settled largely by local conditions. In other words, it is nearly every fellow for himself on that proposition, and I don't believe that any general rule would apply. There is this about it, however. I can understand how it is a mistake to leave any doubt in the mind of your consumer. I never mention the question of the main at all I say to them, if you will buy $250 worth of gas we will run the main in there; and I say to them very plainly, now it is understood that there is merely a guarantee that we get that much business out of it. We don't want to run our gas main in there and have to wait for ten years and get no return, but if you are sufficiently sure of your own position, and you know whether you are going to use the gas or not—I don't—our company can't know if you don't know—if you know you are going to use the gas and are willing to back your judgment by buying $250 worth of it as an absolute and positive guarantee, we will be pleased to take your business. Making that character of a statement in the fifteen years I have sold gas I have had no difficulty on such lines.

Mr. Lowe: The only difference, Mr. Hill, is that you give your consumer the whole bill, while we allow ours one-half, by which method we are earning a little to cover the depreciation, and to that extent, I think we are a little better off than you.

Mr. Hill: Perhaps you are a little better financier than I am.

Mr. Lowe: Referring to the Wells Fargo illustration, I have never known the Wells Fargo people to send their wagons any farther than they had to in San Francisco. Their western delivery limit is Fillmore street, which is about one-fourth of the way uptown. Now what happens to the poor devils who live beyond Fillmore street? They have to pay ten cents, fifteen cents, twenty-five cents extra for delivery service. Now we don't charge anything extra for our delivery service, but Wells Fargo & Co. do, and so does almost every other concern, including the butcher, baker and candlestick-maker. He has reasonable limits, and if he feels he cannot deliver free to you within that limit, he is willing to do so if you will pay the extra costs of the delivery. As to the postal illustration; if the United States Government were earning the entire cost of the postal delivery system we would be paying double the postal rates we now pay. It is true we do pay the full expense, but we pay it in an indirect way, and which is hidden from us. We dont know of the deficit, unless we chance to see an announcement in a lowermost corner of some newspaper page to the effect that the postal system shows a deficit of many million dollars for the year. We could not stand that in the gas business.

Mr. Hill: I think the hardest nut to crack in connection with this controversy, if the company insists on running its own gas mains, is where they come in and say, we would like to take gas from you and we would like to have you extend the gas in our neighborhood, and after applying the company's rule you find you cannot consistently do so, because there is a limit after all, no matter how generous the policy, unless you say you will run anywhere, and you can't do that. Now you say to them, No, we cannot supply you with gas, and they say, Well, do you mean you won't run the main, and we must say, Well, not only that, but we cannot supply the gas, we won't run the main nor let you run it. They say, Do you mean to say if we are willing to advance the money you won't supply the gas under any circumstances? That is about the attitude. Then those men go up and down and say that they are willing to pay for the main and the company won't sell the gas to us, what do you think of that? I had that shoved up to me, and I said, "All right, you can't buy the main, gentlemen, but if you will buy enough gas to assure me you are talking business, I will put the main into you at no expense whatever to you. When it is put in that way they are generally perfectly willing to do it.

Mr. Lowe: I call attention to one important place in this discussion. In the first place, I want to say I am absolutely in sympathy with President Cline's policy in relation to the acceptance of out and out bonuses, as I think it is a most pernicious practice, but I think there are many ways by which one can legitimately seek assistance from consumers, and any one of which can be accepted. Now you doubtless think we have been discussing Mr. Baurhyte's paper, but have we? Are we not in reality discussing President Cline's address? Now, for some peculiar and unknown reason it seems to be an ethical rule that we shall not discuss a president's address; it is an unwritten law that it shall not be done. You appoint a committee, consisting of past presidents of the association, to report on the address, which committee draws up a few beautifully worded and complimentary lines, and which go down in the records, thus ending the matter and the address goes to oblivion. Now President Cline has presented to this association one of the ablest addresses that has ever been given, and yet we are not, for this ethical reason of which I speak, permitted to discuss it out and out. I think it is a great mistake, as a President's address is nothing more than a paper presented by your presiding officer, and it should be open to free discussion, as a paper that is not discussed has lost a great deal of its weight and merit. I am very glad indeed that the opportunity has arisen, by reason of the titles of these other papers,to be able to bring out Mr. Cline's ideas, of which we would otherwise have been deprived, and I hope a way can be found by which we may get out of that old

rut and set aside that mistaken courtesy—that erroneous idea, that we should not discuss a President's address because of a mere ethical consideration.

Discussion on "The Public and Its Complaints."[1]

Mr. Jones: Mr. President, I suppose no man in the gas world has had so much experience with the people as my dear old friend Mr. C. L. Barrett, and he meets the complainant with a pleasant smile and hand grasp, and they go away well pleased, even if the bill is too high, and with a feeling that the gas company is all right. There is one matter, Mr. President, in regard to complaints that I think is quite important, and I would like to impress it upon your minds. We will suppose we have a complaint of poor light—an ordinary insufficiency of gas—which may be due to a variety of causes. The complaint is attended to by an ordinary complaint man. It may be his last job on the afternoon rounds. It may have been an accumulation of weeks or months of naphthalene, which has gradually closed up an otherwise sufficiently large service pipe, and in his hurry he does not remove all of the naphthalene. In a few days we get a repetition of the complaint. We have made it a rule in the San Francisco Gas & Electric Company that all repetitions of complaints of poor light go directly to the engineer's office on a slip of paper. The matter is taken out of the hands of the ordinary complaint department, and is put in the hands of a special complaint man, or men, who go to the premises, and if it is found to be the fault of the workman it is so reported, and we either get another workman or educate the one at fault. If there is some well defined cause for the complaint, such as a constricted service pipe, a meter set in a cold place, or any of the hundred other causes, no matter what the cause is, we remove the primary cause of complaint. I find by so doing that our complaints, which numbered shortly after the fire as many as 700 or 800 a day, have been gradually diminishing. The workmen pay more attention to the cleaning out of services and to the remedying of complaints, and we find, as I said, before that no matter what it costs to remove the cause it is money well invested.

Mr. Lowe: Let me ask Mr. Jones in reference to this question of complaint—of course it is continually bobbing up before all of us—we have been talking a great deal about high pressure gas from time to time and priding ourselves that most of our troubles are removed by compressed gas. We are beginning to have a few years' experience in that respect. Is there not some one present who can give us the benefit of his experience in that line? Mr. Jones, I know, can tell us something about it. Personally, almost all the gas I am delivering is under high pressure, and I must say that we have almost no complaints.

Mr. Jones: I would like very much to speak on that subject, but I fear I would be anticipating Mr. Grover's paper on "Naphthalene Conditions."

Discussion on "Oil Gas Residual and How to Handle It."[2]

Mr. Berkeley: I enjoyed Mr. Valentine's paper very much, because I like originality above everything else. I am a firm believer in getting all we should get out of it. I am very willing to confess I don't know how to do any more than we are doing at the present time. I believe that with each unit of oil gas apparatus there should be built a unit to consume the carbon into water gas, so that you would immediately transform your carbon into a product for which there is a market—namely, gas. Otherwise, the accumulation of it is an expense. And unless it can be moved, and moved promptly, it is a very troublesome thing.

The Chairman: Regarding the use of carbon in water gas manufacture, the Los Angeles Gas & Electric Corporation for several years has been making from a million to a million and a quarter feet a day, using the bricks and the carbon very successfully. During the summer we use the lumps right out of the pile, sun-dried and during the winter we use the brick. The balance of it is briquetted, and sold and consumed as domestic fuel.

[1]Journal of Electricity, Power and Gas, Oct. 2, 1909.
[2]Journal of Electricity, Power and Gas, Oct. 9, 1909.

Mr. Hill: Do you use the lampblack under the boilers?

The Chairman: Very little; just so as to keep the pile down.

Mr. Hill: Do you use all that is necessary to furnish all the steam for the gas plant?

The Chairman: We use first all we require to supply the capacity of our water gas plant, and then as much as there is a sale for is used for domestic fuel. The balance of it we use under the boilers.

Mr. Hill: What I was trying to get at, what has been your experience as to the proportion over and above what is necessary to furnish steam in the manufacture of your ordinary crude oil gas, do you find that you have a surplus of?

The Chairman: There is a very large surplus.

Mr. Hill: After you have used all that is necessary to make all the steam?

The Chairman: We can make all the steam necessary and have a very large surplus.

Mr. Hill: What character of oil do you use there?

The Chairman: Something along about sixteen to eighteen, or even heavier than that. I should say probably fourteen to seventeen.

Mr. Hill: Our experience with oil of a gravity between eighteen and twenty is that after we have used that portion of the lampblack necessary to make steam in our gas plant there is very little left. In other words, it takes nearly all the lampblack that is made in our plant to keep up steam.

The Chairman: Of course I suppose that would follow in a small plant, but in a large plant it is another proposition.

Mr. Jones: What is your substitute fuel under the boiler?

The Chairman: We use crude oil about fourteen gravity.

Mr. Valentine: In regard to Mr. Hill's remarks, my idea is in a small works properly constructed with a separator such as I have described you will get all the lampblack there is, and when the proper heat is carried in the generators, you will produce lampblack enough to make all the steam required.

Mr. Hill: We do that. We have used all that is necessary to generate all the steam that is necessary, and we then have but very little left over.

Mr. Valentine: That is the point I wanted to impress more particularly in my favor, that we are very extravagant in using lampblack for fuel. The time is coming when we shall have a good market for every pound of it, and possibly it will be more valuable than the gas we sell.

Mr. Lowe: What you are trying to urge is that we are using too valuable a material as boiler fuel.

Mr. Valentine: Yes.

(TO BE CONTINUED)

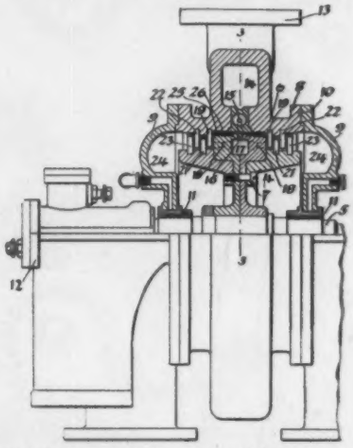
BOOKS RECEIVED.

"The Protection of Railroads from Overhead Transmission Line Crossings." By Frank F. Fowle. 69 pages, 5½x7½ in; 35 illustrations. D. Van Nostrand Company, New York City, and Technical Book Shop, San Francisco. Price, $1.50.

The scope of this book is far greater than is indicated in the title. Though written primarily for steam railroad officials, being a reprint of a paper prepared for the Twenty-seventh Annual Convention of the Association of Railway Telegraph Superintendents, it contains material of value to everyone interested in protection of life and property from exposed transmission lines. After detailing the dangers and illustrating the effects of failure the author describes and compares the several methods of protection in use. These include the screen, the bridge and the catenary types. He then presents general specifications for a typical crossing embodying strength, safety and simplicity. The recognized standing of the author lends unusual emphasis to his recommendations and should render them of value also to every engineer interested in protection from high tension lines.

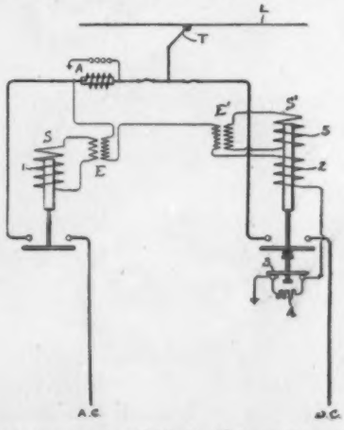
PATENTS

935,438. Fluid-Pressure Turbine. George Westinghouse, Pittsburg, Pa., assignor to the Westinghouse Machine Company. In an elastic fluid turbine, a casing, a rotor located within said casing, means provided in said casing for expanding the motive fluid delivered to the turbine, members mounted on the rotor for abstracting the velocity energy due to said



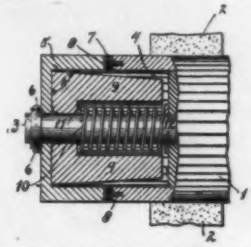
expansion, a collecting chamber provided in said rotor element for receiving motive fluid from said members, instrumentalities located on each side of said chamber for partially expanding the motive fluid contained therein and alternate rows of stationary vanes and moving expansion elements located on each side of said chamber and receiving the motive fluid discharged from said instrumentalities.

935,023. Selective A. C.-D. C. System. George H. Hill, Schenectady, N. Y., assignor to General Electric Company. A selective A. C.-D. C. system for electric cars comprising an A. C. Switch having an actuating coil, a D. C. switch having an actuating coil, an auxiliary coil on said D. C. switch, energy



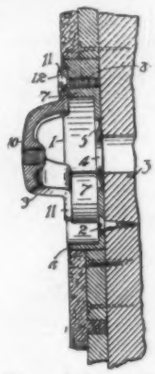
transforming means connected to the power circuit and arranged to supply current by transformer action directly to the actuating coil of the A. C. switch and the auxiliary coil on the D. C. switch, and circuit connections permitting current to flow to the actuating coil of the D. C. switch directly from the source through said transforming means.

935,352. Alternating-Current Motor. Alonzo C. Bell and Thaddeus R. Bell, Westfield, N. J. In a self-starting single-phase motor, the combination of a commutator having its bars overhanging the end of the commutator to form a cylindrical recess surrounding the motor shaft; said shaft; a cap mounted on the shaft having a cylindrical recess corresponding to and facing the commutator recess, said cap being continuously conducting for electricity around its cylindrical wall; a plurality of conducting segments nested radially about the motor shaft within the space consisting of the combined cap and commutator recesses, each of said segments having a horizontal arm and a radial arm, the horizontal arms extending from the cap recess into the commutator recess and the radial arms



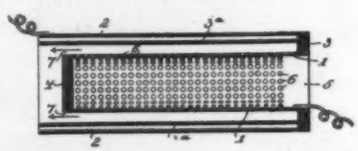
being directed from the periphery of the cap toward the shaft; and a spring located between the end of the commutator and the radial arms of the segments holding their horizontal arms out of contact with the cylindrical interior of the commutator recess and being overpowered by the centrifugal force acting on the segments when the motor is up to speed.

935,097. Outlet-Box for Electric Fixtures. Oscar F. Erickson, Berkeley, and Richard H. Bradshaw, Oakland, Cal. In combination with a backing for lath and plaster, and lath and plaster secured thereon, an outlet box having a base and a cylindrical wall formed integral therewith, said base being secured upon the front wall of said backing and the cylindrical



wall having its front edge substantially flush with the surface of the plaster, said base having a central aperture, and the backing having an aperture registering with the central aperture in the base, said base and wall having also formed integral thereon bosses with screw holes therein, and a crowfoot having its feet secured upon said bosses, said feet being substantially flush with the plaster of the wall.

935,457. Apparatus for Electrically Treating Air and Other Gases. James H. Bridge, Philadelphia, Pa. An ozonizer, containing a tubular electrode having a plurality of perforations through which air or gas may be passed in fine streams from



one side of the electrode to the other, substantially into a multiplicity of electric discharges originating on the surface of said electrode at points adjacent to said perforations, so that the separate gas-streams may be substantially surrounded by such electric discharges and thereby modified.

JOURNAL OF ELECTRICITY
POWER AND GAS
PUBLISHED WEEKLY BY THE
Technical Publishing Company
E. B. STRONG, President
A. H. HALLORAN, Secretary and Managing Editor
DIRECTORS
R. J. DAVIS A. M. HUNT E. M. SCRIBNER C. L. CORY E. B. STRONG
604 MISSION STREET, SAN FRANCISCO

TELEPHONE - - - - - - - - - KEARNY 918

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United States, Cuba and Mexico	per year.	$2.50
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Single Copies, Current Month	each	.10
Single Copies, prior to Current Month	"	.25

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Wire Gauges

There is nothing in electrical work so prone to cause confusion as the senseless practice of designating wire sizes by arbitrary numbers especially when the perplexity is aggravated by a multiplicity of gauge systems. England and America are the chief offenders in this respect, as most of the European countries usually specify the smaller wire sizes in terms of their metric diameter. In England neither the Birmingham Wire Gauge, which is the oldest, nor the British Legal Standard or Standard Wire Gauge, which succeeded it, are based upon any regular law. The American or Brown & Sharpe Gauge, which is also based upon the Birmingham, has been so calculated that the diameters corresponding to the various numbers are in geometrical progression. Other gauges, such as the American Steel & Wire, Washburn & Moen, Old English and Stubb's are largely empirical.

As conducive to reform in this matter we are glad to note that the Association of American Steel Manufacturers now recommends that wire sizes be expressed in decimal parts of an inch instead of being indicated by number. This entails no change in existing standards, being merely a matter of nomenclature. It would seem advisable that this trend toward standardization be extended to the adoption of the metric system of measurement, thus becoming more nearly universal.

Irrigation by Electricity

This week we illustrate another of the great irrigation and power developments that are gradually transforming the once desert wastes of Central Washington into one of the earth's garden spots. Ages ago this area was deluged with a vast flow of lava that obliterated the results of all former geological agents in rendering the land habitable. The rivers were forced to seek new courses, and, in following the lines of least resistance, gradually cut deep canyons that effectually cut off the surrounding lands from their beneficent influence. These higher lands have a fertile soil as a result of subsequent weathering and lack but the enlivening touch of water to become productive.

Today this water is being artificially supplied by man, who is harnessing its energy in order to raise it to levels hitherto inaccessable. It seems peculiarly fitting that the electric power, hydraulically generated, should be utilized as motive power for pumping, thus in a way liquidating its debt. Many of these irrigation projects are of such magnitude as to make their realization impossible without governmental aid. But here and there, private capital is taking the initiative in supplying the pressing needs of certain communities. Where the Government deals with thousand of acres, the private corporations are limited to hundreds,

and yet in the aggregate, these smaller developments constitute an important part of the development that is bringing into being, orchards, fields and gardens in a region destined to become a home of the highest type of civilization, that of a prosperous agricultural people.

High Tension Troubles

Any paper that describes high tension troubles and their remedy is of absorbing interest to electrical engineers. Unfortunately, most engineers are so busy taking care of their difficulties that they have but little time to write about them. A valuable contribution was made to this subject at the Denver meeting of street railway men last week in the course of a report from the committee on power distribution. While this report treats of many phases of the question interesting only to railway men, it also includes some important recommendations that might well be adopted by all electric power companies.

Galvanized steel towers are considered as preferable to wooden pole line construction wherever high voltages and large conducters are in use, as are also suspension insulators as compared with the pin type. Insomuch as insulators form but an insignificant part of the total cost of construction, about one-thousandth, the committee urges that a high insulation factor of safety be employed. "The advances from an admittedly inadequate factor of 5.34 to 6.06, the sufficiency of which is yet to be demonstrated, seems not overcautious in the light of the great importance of absolute continuity of service in heavy street railway operation demanded now." It is poor economy to attempt to save money on the insulation.

Special conditions pertinent to the Pacific Coast are described in an appendix to this report, written by S. L. Foster, chief electrician of the United Railroads of San Francisco. In his experience the two greatest transmission troubles on the Coast are due to fogs and birds. The latter, like many things else in the West, are of great size and sometimes short circuit the wires even when spaced six feet apart. "The combination of dust, fogs and night winds applies a conducting smear over the insulators, the pins, the cross-arms and the poles of our high tension lines that results in most unexpected and extraordinary phenomena to disturb the electrician's equanimity."

If a large insulation of factor safety is not sufficient to take care of this difficulty, it becomes necessary to wash some of the insulators at least once a year. Mr. Foster further recommends that iron pins be substituted for wood and suggests that accidental or mischievous short circuiting of three-phase lines may be minimized by placing the wires so that the apex of the triangle will be the lowest point. Many of the conditions described which are peculiar to the Coast, requite in a way for the freedom from lightning, snow and hurricanes that we enjoy.

The Low Pressure Steam Turbine

A misconception exists in the minds of some engineers as to the reasons for the economy of the low pressure steam turbine. They have been told that the output of their power plant can be materially creased by installing a steam turbine that will be run by the exhaust steam from a reciprocating engine, and they immediately jump to the conclusion that they are thus getting something for nothing. As a matter of fact the reverse is true, for they are actually getting nothing for something, when running an ordinary reciprocating engine noncondensing. Such an engine utilizes only half the energy of the steam, the other half going to waste.

This depends upon the fact that there is as much energy in steam between exhaust pressure and the pressure of a good vacuum, as there is between 150 pounds and atmospheric pressure. Theoretically this low pressure could be used in a very large engine cylinder. But in practice the friction in a cylinder large enough to utilize this expansion employs the steam to such poor advantage that it does not pay to install the apparatus necessary to produce the vacuum. The problem is something like that of trying to use a five-foot crowbar in a three-foot hole.

The design of the low pressure turbine is such that it can effectively use this energy remaining in a large volume of steam and resulting from a high ratic of expansion. In other words the turbine becomes a second, third or fourth low pressure cylinder, according as the reciprocating engine is of the single, compound or triple expansion type. The turbine also occupies less space and runs at a higher rate of speed, making it peculiarly adaptable as a prime mover for an electric generator. Though this fact was announced by Professor Rateau over five years ago, it is only recently that its practicability has become universally recognized. Within the past year a large number of turbine installations have been made, either as auxiliaries for existing plants, or to utilize the waste power in industrial processes.

This increased efficiency is not obtained without the aid of further auxiliaries, it being particularly necessary to install a condenser to obtain the proper vacuum. The power required to produce and maintain this vacuum, whether in a barometric or surface condenser, has been found to be about one-twentieth of that supplied by the turbine. Though these turbines are usually designed to meet the special conditions under which they are to work, there are cases on record where a high pressure turbine is being successfully operated with exhaust steam. There are also mixed pressure types intended to use both the high and low pressure steam. The low pressure turbine, like the tungsten lamp, is but another example of what constitutes rational conservation of resources, that wise utilization which doubles the output without increasing the boiler capacity.

PERSONALS.

Walter Fagan was in San Francisco from Los Angeles this week.

O. R. Williams, chief engineer for the Hawaiian Electric Company is in San Francisco.

Walter Cary, manager of the Westinghouse Lamp Company, New York, is in San Francisco.

W. J. Davis Jr., Pacific Coast engineer of the General Electric Company is in the Northwest.

H. H. Trowbridge, attorney for the Los Angeles Edison Electric Company, was in San Francisco this week.

Thomas L. Morin, consulting mechanical engineer, left San Francisco this week for a trip throughout the Northwest.

C. H. Pennoyer, Pacific Coast manager of the National Conduit & Cable Company, left San Francisco this week for the Northwest.

F. C. Terry, secretary, and B. G. Tremaine, treasurer of the National Electric Lamp Co. of Cleveland, Ohio, are visiting the Pacific Coast.

Franklin C. Green, Jr., formerly at Jackson College, Jackson, Miss., is now teaching at the Portland School of Trades, Portland, Oregon.

A. L. Valentine has resigned as deputy engineer for King County, Washington, to become superintendent of public utilities for the city of Seattle.

T. E. Collins of the Westinghouse Electric & Manufacturing Company, San Francisco office, returned with twelve first prizes from the State Fair at Portland.

Chester N. Weaver, vice-president and general manager of the Studebaker Bros. Company of California returned to San Francisco last week from an Eastern trip.

William A. Stacey is in San Francisco in the course of a visit to the Coast in the interests of the Bryant Electric Co. and the Perkins Electric Switch Manufacturing Co.

C. E. Corrigan, vice president of the National Metal Molding Co. of Pittsburg, is making a trip throughout the Pacific Coast. This week he was entertained in San Francisco.

J. Coffee Hays, president and general manager of the Mt. Whitney Power Company, was in San Francisco last week and was a member of the party visiting Yosemite Valley with President Taft.

Hayden Eames, general manager of the Studebaker Automobile Company, and E. Le Roy Pelletier, advertising manager for the same company, left San Francisco early this week for Portland and Seattle.

H. C. Goldrick, Pacific Coast manager for the Kellogg Switchboard & Supply Co., has returned to San Francisco after a successful trip throughout the Northwest. He leaves for Los Angeles today.

R. H. Sheasby, president of the California Valve and Air Brake Company, has gone to Los Angeles to confer with stockholders with a view to extending manufacturing facilities for the valve recently put on the market by the firm.

William A. Brackenridge arrived in Los Angeles this week to assume his duties as vice-president for the Southern California Edison Company. Hitherto Mr. Brackenridge has been a member of the New York State Canal Board with headquarters at Niagara Falls.

W. Brewster Hall has been promoted to the position of assistant sales manager for Pass & Seymour, with headquarters at Solvay. The New York office is in charge of F. S. Baldwin, late of the Syracuse Supply Company. Mr. Baldwin has been engaged in the electrical jobbing business for the past five years, so brings the benefit of his experience from the distributors' standpoint.

TRADE NOTES.

Henry F. Frosch & Company announce the removal of their office and warerooms from 656-658 Howard street, to the Electric Building, 171-173 Second street, San Francisco.

Duncanson & Haroldson, Inc., has been awarded the contract for the sub-station of the Sierra & San Francisco Power Company in Visitacion Valley, south of San Francisco. This is the sub-station through which will be transmitted the power from the Stanislaus Power Company's plant to supply the United Railroads of San Francisco.

W. W. Haslehurst of San Francisco has just completed a $20,000 contract for a pumping plant on a swamp land reclamation district on the Sacramento River, about 30 miles from the City of Sacramento. One 200 horsepower triple expansion, marine design engine, directly connected to a 30-inch centrifugal pump, having a suction pipe 40 inches in diameter by 100 feet in length, and a discharge pipe of the same dimensions. The engine and pump, with the necessary separator, pipe fittings, etc., were manufactured by Mr. Haslehurst at 2122 Folsom street and installed by him. The capacity of the plant at the test was 40,000 gallons per minute to a height of 18 feet.

The Kelman Electric & Manufacturing Company, of Los Angeles, Cal., and Pierson, Roeding & Company, of San Francisco, have completed arrangements whereby the latter firm acquire the Pacific Coast agency for the Kelman high voltage oil switches and circuit breakers. This company has branch offices in Los Angeles and Seattle, the latter office especially covering a large territory, which includes Oregon and Washington, as well as British Columbia and Alaska, and is particularly well qualified to handle this line, having already secured several large orders. In view of the extensive power developments now under way and projected, it is believed this arrangement has been made at an opportune time for increasing the sales of this well known apparatus

NEW CATALOGUES.

The Matte Tapping Car catalogue just issued by the Pacific Foundry Company, San Francisco, deals with the Kilker's patent car, giving description, method of operation and dimensions.

"Dean Electric Doings" for September from the Dean Electric Company of Elyria, Ohio, contains a description of the new Dean common battery telephone circuit, the No. 4538 type receiver with laminated core and other Dean specialties.

The Detroit Fuse & Manufacturing Company, Detroit, Mich., are distributing revised price lists on their line of "Arkless" indicating fuses. In addition to containing complete list prices on National Code Standard fuses, these price lists call special attention to the absolute guarantee placed on every "Arkless" fuse, and to the special features embodied in this line.

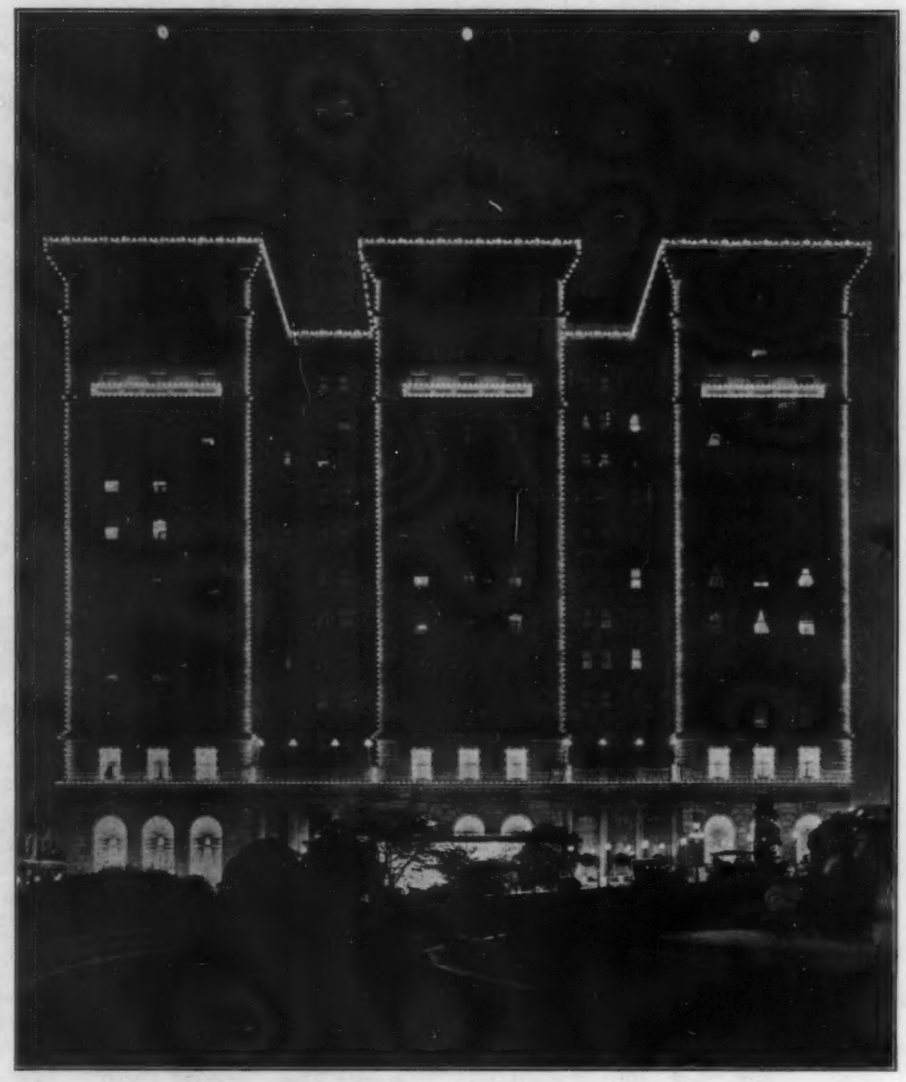
To provide for a temporary supply of power, the General Electric Company has designed and developed portable substations consisting of specially arranged cars containing complete sub-station equipments including a rotary converter or motor-generator set of the required capacity, transformers, switchboards and accessories. A bulletin on this subject has been issued by the General Electric Company under No. 4694.

The increase in the use of short trains during rush hours and during periods of congested traffic on electric railways which normally operate single cars, and the necessity of a suitable air-brake equipment for this service, resulted in the development of the emergency straight air-brake system by the General Electric Company. A description of this system is given in detail in Bulletin No. 4701, and will be of considerable interest and use to any one connected with railway work.

INDUSTRIAL

ST. FRANCIS HOTEL ILLUMINATION.

The accompanying illustration shows the electrical illumination of the St. Francis Hotel, San Francisco, as executed by Mr. Hightower with 10,000 Sunbeam lamps. The building to the left is Hotel Stewart, which also contains 1250 Sunbeam Gem lamps.



Electrical Illumination of the St. Francis Hotel.

One thousand eight hundred and sixty Sunbeam Class "A" lamps—8 c. p., 120 volt, are used in outlining the St. Francis Hotel while each ball on top of flagstaff has thirty 4 c. p., 120 volt lamps. The white blaze of light in the first and second floors is caused by Sunbeam Tungsten lamps.

This remarkable illumination is a permanent feature and all material consisting of conduit, Habirshaw wire, Crouse Hinds condulets and Sunbeam lamps was furnished by the Western Electric Company. In the near future these lamps, as well as the entire electric equipment of this hotel, will be operated by a Western Electric generating plant, now being installed. The plant will have four Western Electric engine type, 3-wire, direct current generators, with a combined capacity of 825 kilowatts.

GENERAL ELECTRIC COMPANY AWARDS AT A. Y. P. EXPOSITION.

The General Electric Company has received grand prizes (highest award) at the Alaska-Yukon-Pacific Exposition in each class of electrical apparatus in which an exhibit was made by the company. G. E. apparatus was ranked first in the following divisions: Apparatus for cooking by electricity, apparatus for heating by electricity, automatic motor starters, arc lamps, bonds, cabinets, circuit breakers, cutouts, fans, indicating instruments, integrating instruments, insulated wires, insulated cables, incandescent lamps, mine locomotives, motor generators, motors for direct current, motors for alternating current, recording instruments, rectifiers (mercury arc), sockets, switches, transformers, wiring devices. G. E. turbines were also entered in the Government exhibit in which no awards were made.

MacGovern, Archer & Co., 114 Liberty street, New York City, send a catalogue list of electrical and steam machinery.

ELECTRIC POWER WAGONS.

BY HAYDEN EAMES

At least ten years have elapsed since any invention or engineering improvement has been required to make power wagon transportation of merchandise in cities more economical than anything that could be done with draught animals. The extraordinary hesitation of those interested in taking advantage of this fact is an unusually obvious example of the tendency of commercial laws toward evolution rather than revolution. The mercantile conditions which would have ensued in case the entire interested public had discovered this advantage as soon as available, can be better imagined than described. In those localities which are informed on matters of this kind the interested public has long since ceased to look for some Thomas-Edison-Westinghouse-Smith-Moses to lead them out of the wilderness. They recognize that the retardation in the introduction of power wagons is due mainly to their own inaptitude and lack of knowledge, and instead of getting out a witch-hazel stick to search for inventors they address themselves to the task of self education.

Visiting and Local Studebaker officials Seated in the New Studebaker "40" Car. From left to right the occupants are Chester N. Weaver, General Manager of the local branch, John H. Engal, Manager of local automobile department, E. Le Roy Pelletier, advertising manager of the company, and Hayden Eames, general manager of the organization.

As a matter of fact, there are very few delivery installations in any city in which a competent substitution of power wagons for draught animals would fail to effect a saving of at least $5,000 per annum at a comparatively small increase of outlay, and this has been true for a matter of ten years past. Moreover, the education required is by no means as much in the direction of care and operation as it is in the direction of intelligent application to the required purpose. A man who, with a given amount of clothing business will substitute six sewing machines for six sewing girls would indeed be an idiot. In this country at least, the item of stablemen and drivers is the largest item in all merchandise delivery enterprises. The power wagon owes its economical supremacy to its labor-saving qualifications. If through stupidity, or worse yet, mental habit or tradition, the power wagon is applied so that no labor is saved, then nothing is gained, and yet it is the easiest thing possible to apply it so as to save the $5000 a year above mentioned.

The unthinking public guides its mental footsteps by dogma. They do not recognize the existence of mental habit and yet every act of ninety per cent of our population is directed by mental habit. Years ago the Adams Express Company placed in service an electric delivery wagon in the suburbs of Pittsburg The district agent, Mr. Hiner, was a very intelligent man. The sub-agent a creature of mental habit. The electric wagon was equipped with iron tires. The first snow-fall came; the thinking district agent telephoned the unthinking sub-agent for information in regard to getting out his wagons on the morning succeeding the snow; the sub-agent reported that the "horses were not yet out," but the automobile had made two trips BUT it was not practicable because it had taken three-quarters of an hour to "put sharp corks on the wheels." Hiner's reply was: "Let me know when the horses come out." At half-past one that afternoon the sub-agent telephoned Hiner that the horses were out. Hiner asked: "What kept them?" The sub-agent replied: "We were sharp-shoeing them." Hiner: "When did you begin?" Sub-agent: "Three o'clock this morning." Hiner: "You told me this morning that the automobile was impracticable because it took you three-quarters of an hour to sharp-shoe it and you have been six or seven hours sharp-shoeing the horses." Sub-agent's reply: "Oh! we have always been doing that."

To the readers of this article such a case of brain fog seems incredible, but as a matter of fact this has been the principal obstacle to the introduction of power wagons for over ten years and has been the only thing that has made it possible for manufacturers to prepare for the conversion which is now upon us.

Of course human vanity plays a large part in this

retardation. One of the last people to whom the user of power wagons looks for a failure is he himself and yet he himself is usually the cause of it.

Ill advised salesmen assist in the mental confusion attendant upon ignorance. The best and most enlightened organizations engaged in the business, such as Studebakers, invariably decline to sell a power wagon without thoroughly investigating the economical questions involved. Irrespective of the ethical questions involved, no manufacturer could make a worse mistake than to further retard the progress of this business by countenancing the misapplication of power wagons for the trifling returns represented by the profit on any given installation, and yet the majority of manufacturers themselves overlook this point and foolishly instruct their salesmen to make a sale wherever they can, regardless of consequences. We hate to think that Studebaker's is the only exception, but the name of this firm is so endeared to the people of California that perhaps they do not join us in this idea.

Among other examples of misinformation and brain fog is the one of electricity vs. gasoline. It is very hard for the unanalytical reader to understand that each has its field. In the majority of cities merchandise transportation requiring more than one or two units can be much more economically conducted with electric wagons than with gasoline wagons, but in all those cases where the distance involved, the character of the roads and the nature of the traffic enables the user to take full advantage of the additional speed of the gasoline vehicle, the latter is usually but not always preferable. The difference in saving of the two kinds of power is very conspicuous, but the art is so new and the knowledge of it so little disseminated that it takes an expert to measure it out.

San Francisco is one of the most backward cities in the country in the substitution of power wagons for draught animals. It is the only thing in which it is backward, but it is with a great deal of satisfaction that we learn that Studebakers are about to organize in their local branch the same kind of an expert power wagon engineering organization that they have at other branches for the conspicuous benefit of the local public.

NEW BENJAMIN TUNGSTEN FIXTURES.

The Benjamin Electric Company has recently placed upon the market a new tungsten fixture with hooded enameled steel reflector. These fixtures are built up around the type 3-T tungsten cluster. They have a 16-inch white enameled steel reflector, deeply hooded to receive the cluster in such a manner that the lamps are in proper relation to the reflecting surface. The outlets are at an angle of 16 degrees with the vertical. This slight angle not only does not endanger the filament of the lamps but adds materially to the lighting efficiency of the fixture inasmuch as one-half of the light of each lamp is directed downward and the other half at the same angle upward, to be re-directed by the reflector. Thus very little of the light of one lamp passes through the other lamps.

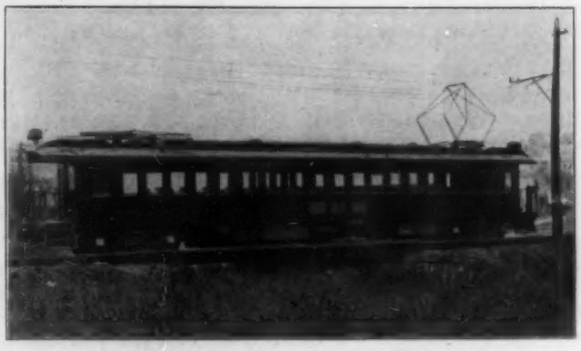
The cluster body is attached to the reflector by means of a flange. A water-tight joint is secured by the use of two rubber gaskets. These flanges are furnished for ⅜-inch or ½-inch pipe; the former for indoor, the latter for outdoor work. Two to four-light fixtures take 100-watt lamps; 5-light fixtures, 40 or 60-watt lamps. They may be furnished either multiple or series. The Benjamin Electric Company's Pacific Coast offices are at 151 New Montgomery street, San Francisco.

Bulletin No. 4700, recently issued by the General Electric Company, is devoted to a description of Type R-2 voltmeters and ammeters for use on alternating and direct current switchboards.

MOTOR CARS FOR NEW HAVEN SUBURBAN SERVICE.

At the East Pittsburg shops of the Westinghouse Electric & Manufacturing Company, there is now being installed the electrical equipment of a number of motor cars for the suburban service of the New York, New Haven & Hartford Railroad. These handsome cars are designed to operate on both the 11,000-volt alternating-current catenary trolley of the main New Haven electrification, and on the 600-volt direct-current third-rail section entering the New York terminal.

By reason of the fact that the New York, New Haven & Hartford equipments are required to operate on the New York Central direct-current third-rail, the control equipment for effecting a change from alternating to direct current is necessarily more extensive than had the control been arranged for straight alternating-current operation throughout, but as seen in accompanying illustration, this auxiliary apparatus has been so well distributed under the floor that there is ample room for everything in the space between the trucks.



Motor Car for New Haven Suburban Service.

The cars, which are intended to pull trailers, are equipped with four series compensated motors. These and the step-down auto transformers are supplied with forced ventilation from the blower system. When the equipment is operated under forced ventilation the one-hour railway rating of each motor is 200 horsepower. Each car is guaranteed to haul two 50-ton trailers and when so operating will accelerate normally at a rate of .7 miles per hour, per second.

The arrangement of the motors differs from that of any other cars in use in this country, in having the motor geared to a quill surrounding the axle, which is geared to the dividing wheels by means of dividing springs of the same type as are used successfully on the New Haven locomotives.

The cars are 70 feet long, weigh 86 tons, and have a seating capacity for 72 persons. Cars and trucks were built by the Standard Steel Car Company, and are of fireproof, steel construction throughout. They are handsomely finished and are said to be the most easy-riding cars ever built.

NEW CATALOGUES.

The General Electric Company has issued Bulletin No. 4676 illustrating and describing various types of enclosed arc lamps for use on direct current and alternating current circuits for interior illumination. The publication includes a description of the use of these lamps for blue printing work. It contains also illustrations and descriptions of lamp hanger boards, globes, and reflectors.

Bulletin No. 4691, from the General Electric Company, describes motors for use in connection with smaller machines found in machine shops. Accompanying this bulletin is a diagram giving the dimensions of the motors of various sizes, the horse power capacity, synchronous, and full-load speeds. This publication describes both single-phase and polyphase motors of a type which can be arranged for use not only in a horizontal, but in a vertical position.

APPROVED ELECTRICAL DEVICES

AUTO STARTERS.

"Potential-Starters" 5-2000 H. P., 110-220 volts. Types A. B. C. D and F. Oil immersed drum switches and transformer coils in iron cases. Approved Sept. 9, 1909. Manufactued by

Allis-Chalmers Company, Milwaukee, Wis.

PANELBOARDS.

Two and three-wire panelboards, 125, 125-250 and 250 V., with or without main line knife switch and fuses. All standard types: branch circuits with open link, Edison plug, or cartridge enclosed fuses with or without knife or snap switches. Approved Sept. 10, 1909. Manufactured by

Wurdack Electric Co., Wm., 17-19 N. 11th St., St. Louis, Mo.

RECEPTACLES, STANDARD.

"A. E. G. Co." 3 A., 250 V.; Conduit Box Type, Cat. No. 776; Two-Wire Moulding, Cat. No. 727; Cleat Type, Cat. No. 826. Approved Sept. 12, 1909. Manufactured by

Atlantic Electric Goods Co., 3 West 29th St., New York, N. Y.

RECEPTACLES, WEATHERPROOF.

"A. E. G. Co." 3 A., 250 V. Conduit Box Type, Cat. No. 777; Knob Type, Cat. No. 901. Approved Sept. 12, 1909. Manufactured by

Atlantic Electric Goods Co., 3 West 29th St., New York, N. Y.

SIGNS, ELECTRIC.

"American Lens" Signs. Sheet metal signs with angle iron frames. Letters are outlined with round glass lenses and illumination is secured by means of lamps mounted in pairs on the inside of the sign. One lamp of each pair is supplied from one circuit and the other lamp of each pair form a second circuit. This arrangement permits the use of one or two flashers, as desired. Approved September 7, 1909. Manufactured by

American Sign Co., 219-223 E. Main St., Kalamazoo, Mich.

SOCKETS, STANDARD.

"Bryant" Brass Shell Sockets. Key, 50 C. P., 250 V. Cat. Nos. 9386, 43389, 50760. "Security Snap," 44147, 44148 and 44814. "New Wrinkle," 59480, 59481 and 59484. Fixture Sockets, Cat. Nos. 1317 and 1318. Pendant, Cat. No. 99386; "Security Snap," 44151; "New Wrinkle" 59486. Also the above with insulated metal key. Keyless, 3 A., 250 V. Cat. Nos. 9392, 43390, 50768. "Security Snap" 44149, 44150 and 44815; "New Wrinkle" 59482, 59483 and 59485. Fixture Sockets, Cat. Nos. 1319 and 1320. Pendant, Cat. No. 99392; "Security Snap" 44152; "New Wrinkle," 59487. Pull, 50 C. P., 250 V. Cat. Nos. 65250-65252, inclusive. Twin Sockets, Cat. Nos. 46750-46752, inclusive, for fixture use only. Also above types with shade holders attached. Approved Sept. 11, 1909. Manufactured by

Bryant Electric Co., The, Bridgeport, Conn.

SOCKETS, STANDARD.

"Paiste" Brass Shell Sockets. Key, 50 C. P., 250 V. Cat. Nos. 9386, 19386, 43389, 49386, 50760, and "Security Snap" 44147, 44148 and 44814. Keyless, 3A., 250 V. Cat. Nos. 9392, 19392, 43390, 49392, 50768, and "Security Snap" 44149, 44150 and 44815. Pull 50 C. P., 250 V. Cat. Nos. 61120 and 61121. Pendant, key and keyless, 99386 and 99392, respectively. Also above types with shade hoiders attached. Approved Sept. 7, 1909. Manufactured by

Paiste Company, H. T., 32d and Arch Sts., Philadelphia, Pa.

SWITCHES, PENDANT SNAP.

"CH" 6 A., 125 V., 3 A., 250 V. All porcelain Cat. No. 7000 for pendant use. With brass cap for fixtures or pendants, Cat. Nos. 7001 and 7002 and two circuit pendant Cat. No. 7020. All porcelain Cat. No. 7010 for pendant use 10 A., 125 V., 5 A., 250 V. Approved Sept. 10, 1909. Manufactured by

Cutter-Hammer Mfg. Co., Milwaukee, Wis.

NEW CATALOGUES.

The Harvard Electric Company of Chicago and New York have issued bulletin No. 19 relating to brackets, sectional switch boxes, conduit boxes, telephone fuses, wire joints, etc.

Fairbanks, Morse & Co. have issued a new and interesting catalogue on their small engines from 1 to 12 h. p. in which they describe for the first time their new 1 h. p. engine "Jack Junior."

The Electric Storage Battery Company has reprinted as Bulletin 116 a paper on "Some Points on the Operation and Care of Exide Vehicle Batteries" as read by H. M. Beck, at the Chicago convention of the Society of Automobile Engineers.

Universal metering panels and switchboards are illustrated and described in an attractive catalogue from the Agutter-Griswold Company, 411 Occidental avenue, Seattle, Wash. For an office building this provides a safe and quick method of switching any office on any meter without any change of service.

The General Electric Company has perfected and has now on the market luminous arc headlights for both street service and use on mining locomotives. The principal advantage of this headlight is high efficiency; other advantages are enumerated in Bulletin No. 4698, recently issued by the company and supplied on request.

Two publications illustrating and describing in more or less detail the latest construction in connection with 500-volt, 40 h. p. and 600-volt, 65 h. p. railway motors, have just been issued by the General Electric Company under numbers 4693 and 4692, respectively. These publications describe the GE-88 and GE-210 motors and include tables of schedule speeds and various characteristic curves and motor dimensions.

Fairbanks, Morse & Co. have issued a new catalogue on Wood and Steel Windmills. The theory and details of construction are analyzed and published completely for the first time in this book. Pumping systems and the new "Femco underground force pump" are described in detail. The technical information and practical suggestions contained in this book ought to be read by all of those interested in windmill pumping.

"Foundry Costs" by R. H. Postlethwaite, superintendent of the Risdon Iron & Locomotive Works, San Francisco, and "Our Billiken," by E. J. Fowler, president of the Pacific Foundry Company, San Francisco, are the titles of articles appearing in the September issue of "The Monthly News-Letter" by the California Metal Trades Association. Both bear upon the practical problems with which the Pacific Coast foundryman is compelled to confront.

In connection with the application of motor drive in modern factories, a safe and efficient method of control is essential. The extensive adoption of fire-proop devices in cotton-mills, flour-mills, saw-mills and other establishments operating under similar conditions has made necessary a compact, fire and dust-proof, oil break switch of small capacity and moderate cost. A switch of this character is described in Bulletin No. 4682, recently issued by the General Electric Company.

The department of mechanical engineering of the University of Tennessee, at Knoxville, send a copy of the thirteenth edition of their "Manual for Engineers." Some of the most important tables in the book are as follows: Areas and circumstances of circles, square and cube roots, sines, tangents and secants, both natural and common, steam tables dealing with capacity of turbines, extensive tables for electric wiring, interest tables, etc. This publication is leather-bound and in vest-pocket size. It is supplied at fifty cents per copy.

NEWS NOTES

FINANCIAL.

EL PASO, TEX.—Mayor Sweeney has been authorized to issue a proclamation calling for an election to decide the water question. The date is to be set later.

NAPA, CAL.—At a meeting of the Napa City Water Company, it was decided to issue bonds for $100,000 to pay off the debts of the company, extend its business and develop its properties.

VANCOUVER, B. C.—The Council of the township of Richmond has passed a law providing for the issuance of bonds in the sum of $275,000 and the purchasing as constructing of a municipal water plant.

SANTA CRUZ, CAL.—The citizens of this city have petitioned the City Council to issue bonds to the amount of $500,000 for municipal improvements to include a new system of water mains and other improvements.

SAN FRANCISCO, CAL.—George H. Whipple, receiver of the Stanislaus Electric Power Company property, has filed his report in the U. S. Circuit Court, showing that the receipts of the month had been $103,762.97, and expenditures $84,910.40.

NORTH YAKIMA, WASH.—The City Council has reached an agreement with the Northwest Light & Power Company for the purchase of the company's water plant, at cost of $310,000. A special election will be called to vote on the issuance of bonds to meet the expense.

INCORPORATIONS.

GOODING, IDAHO.—The Woodworth Addition Waterworks Company has been organized by E. L. Woodworth, W. H. Cannan, W. D. Fales, D. H. Buckley and others for the purpose of putting in a system of his own. Necessary pipe and material will be ordered at once.

SAN FRANCISCO, CAL.—Home Long Distance Telephone Company, capital stock $10,000,000, shares $100 each, subscribed $300,000, by L. S. Beedy, A. S. Keeler, James Lanagan, H. G. Holabird and A. Coxhead, 500 shares each; Guy Knupp and J. E. O'Brien, 250 each.

SAN DIEGO, CAL.—As an outcome of a franchise being granted to G. W. Purcell for an electric railroad, articles of incorporation have been filed by the San Diego, El Cajon, Escondido Railway Company, whose purpose is to build an electric line through City Park and to Escondido. Capital $2,250,000. Directors are: G. W. Purcell, H. G. Crowe, A. C. Riordan, San Diego, and others.

TRANSMISSION.

OROVILLE, CAL.—Frederick F. Conger has appropriated 5000 miners' inches of the water of Butte Creek for power for domestic, mining and irrigation purposes.

REDDING, CAL.—The Sacramento Valley Power Company will extend its lines to Red Bluff and Chico, construction work now being under way. The company has already applied for a franchise in Chico. The trustees of that city took favorable action last week, and bids for the sale of a franchise will be opened November 2.

KLAMATH FALLS, ORE.—The reclamation service will make preliminary arrangements for establishing power plants along the Link River. The power to be created will be used in pumping stations in connection with the Klamath reclamation project. Complete drainage of the marsh dyked by the railroad will be accomplished by pumping. About 40,000 acres can be reclaimed by this process within a very few years.

FRESNO, CAL.—William S. Douglas and C. M. Russell have filed notice of the appropriation of 15,000 cubic feet of water from Fish Creek to carry the water by tunnel for 2 1-3 miles from a diversion dam to the junction of the Great Bluffs with the middle fork of the San Joaquin River on sections 3 and 4, 4-26 and 9 and 10, 5-26, for power purposes; also for a dam and reservoir site 150 feet high and 900 feet long to form a storage reservoir of about 200 acres, the water to flow to Fish Creek in connection with the water rights there.

SAN BERNARDINO, CAL.—The County Supervisors have passed a resolution directing an advertisement for the sale of a franchise for electric and power pole lines over various highways in the county. The applicant is the Southern California Edison Company, the new company into which the big companies of Southern California were recently merged. The sale of the franchise occurs on November 2. The resolution provides that the company is to pay the county 20 per cent of the gross proceeds after the first five years.

SACRAMENTO, CAL.—After seven years of litigation over the control of the water of the American River at Folsom, the State of California, through the prison board and the Sacramento Electric, Gas & Railway Company, have compromised. The power company is to have control of the waters as before they were restrained, but must stop or commence the flow upon written request of the prison board when it is shown desirable to State interests. The State brought the action against the power company, claiming that the flow of the American River was interfered with to the extent that the Folsom River could not secure enough power to operate the prison lights or other facilities. The State won the suit, but found that in dry seasons by not damming the river there was not sufficient flow to give the prison lights.

ILLUMINATION.

PORTLAND, ORE.—Grand avenue and East Morrison streets are to be illuminated by cluster lights placed at the four corners of all intersections and ten every fifty feet.

OGDEN, UTAH.—C. A. Cohen, of Salt Lake, managing engineer for the Utah Light & Railway Company, states that within a short time the erection of the company's power house will be under way.

SAN FRANCISCO, CAL.—The Board of Public Works has awarded to Van E. Britton the contract for supplying the gas testing apparatus to replace that which was destroyed in the fire of 1906. The bid was $1,766.25.

LONG BEACH, CAL.—The Inner Harbor and Edison Gas Companies have been asked to take steps looking to the removal of the plants from the residence sections of the city to the west or harbor end of town.

ALBUQUERQUE, N. M.—The City Council has passed an ordinance granting an electric light and power franchise in the city to M. P. Stamm, F. G. Pratt, D. A. Porterfield, etc.

SAN DIEGO, CAL.—The adoption of an ordinance instructing the city clerk to advertise for bids for public lighting has been recommended by the Common Council. The ordinance provides for 333 lights. The contract will be awarded for five years.

HELENA, MONT.—Until Monday, October 18th, 1909, the city of Helena will receive sealed proposals, in accordance with specifications for furnishing f. o. b. Helena, Mont., the equipment for an electric light plant, to wit: Two dynamos each 100 k. v. a., three phase, 60 cycle, 2300 volts, direct connected; two producer gas engines, 150 horsepower each; two 150 horsepower anthracite producer gas generators, one three-horsepower gasoline engine for driving blower, air compressor and coal elevator, two switchboards and feeder panels.

VISALIA, CAL.—The Mt. Whitney Power Company has bought the electric light system of the Consolidated Heat, Light and Power Company in the city of Tulare. For ten years past the Mt. Whitney Power Company has been selling current at wholesale to light Tulare, but when the contract expired began the erection of a system in that city. The Consolidated Company did not think Tulare would support two companies in the same line of business and the sale of its lines and business followed. Tulare will be placed on a meter basis as fast as meters can be installed.

OAKLAND, CAL.—The second extension of the underground wire district has been recommended by the board of public works in a resolution to the City Council, asking that an ordinance be framed and passed to effect the extension. The proposed district for underground wires will run out Broadway to Piedmont avenue, thence extending out Piedmont avenue to the city line. The removal of the wires in Piedmont avenue was commenced some time ago under an agreement with the gas, telephone and telegraph companies. In Twelfth street and East Twelfth street, if the desired ordinance is passed, the overhead wires will be removed as far east as First avenue The present underground wire district is to be extended from its present northern limit to 22d street, in both Broadway and San Pablo avenue.

TRANSPORTATION.

ASTORIA, ORE.—It is reported that the Astoria, Seaside & Tillamook Railway Co. will soon begin work on the proposed Astoria, Seaside trolley line.

BELLINGHAM, WASH.—Business men of this place are taking steps to secure an interurban railway extending south into Skagit county and may organize a company with this end in view.

EUGENE, ORE.—It is reported that the Portland, Eugene and Eastern Railway Company will begin building the Eugene City junction link of the trolley line between Eugene and Salem soon.

WALLA WALLA, WASH.—Preliminary survey of the Spokane, Walla Walla & Western Traction line from Dayton to Wallula via Waitsburg and Walla Walla has been completed by Locating Engineer K. S. Keating.

LOS ANGELES, CAL.—The Board of Supervisors will receive sealed bids up to November 8th for a street railway franchise on Melrose avenue and Heliotrope Drive, thence westerly along Melrose avenue to westerly line of Seward street.

ROSEBURG, ORE.—Frederick Kuettner and Jacob Haas, both of Portland, have pledged themselves to furnish a bond of $1,000,000 to build an electric railway from this place to Marshfield within 24 months after the survey is completed and right of way secured.

TACOMA, WASH.—A. W. Shenck, W. E. Everett, A. M. Richards, George Senoir and C. E. Phoenix are back of The Skagit, Cascade and Chelan Railway Company which has been incorporated by them, with a capital stock of $25,000,000. The proposed line and branches will run from Rockport, via Lake Chelan, to Spokane. The head offices of the company will be in Tacoma. Power will be generated on Thunder Creek.

SAN FRANCISCO, CAL.—Bids for 84 steel passenger coaches costing more than $1,500,000 will shortly be asked for by the S. P. Company. The cars in question will be for use on the Alameda electric local lines upon which it is expected service will be inaugurated early next spring. Fully 250 cars will be required for the new suburban service which will include the Oakland, Fruitvale and Berkeley lines. Detailed plans for the new steel cars have been completed at the office of Electrical Engineer Babcock, according to Assistant General Manager Scott. The new coaches will seat about 100 passengers each and will be constructed of steel throughout. Even the window sashes and door frames will be of steel. The cars will be fitted with double platform and double doors which will permit the egress or ingress of two persons at once. While they will not be equipped with the common accordion vestibules, the coaches will have rounded ends which will enable passengers to go from one car to another with perfect safety. The power house at the tidal canal bridge is being rushed and work upon the Oakland and Berkeley lines is being pushed ahead steadily.

WATERWORKS.

NEEDLES, CAL.—B. L. Vaughn of the Calzona Land & Townsite Company, is arranging with the Needles Machine Works to put in a system of water works at Calzona.

SAN BERNARDINO, CAL.—The Riverside Water Company and the users of water from the Santa Ana River and watershed in Orange County have reached a compromise.

LOS ANGELES, CAL.—The Board of Water Commissioners is receiving sealed bids for 140 pieces of 18-inch Standard Bell and Spigot cast iron water pipe, being approximately 130 tons.

LOS ANGELES, CAL.—The Board of Water Commissioners is receiving sealed bids for furnishing the water department with lead service pipe as follows: 7000 lbs. ½-inch A, 1000 lbs. ¾-inch A, 2000 lbs. 1-inch A.

LOS ANGELES, CAL.—Sealed bids will be received at the office of the treasurer of the Pacific Branch N. H. D. V. S. Soldiers' Home, until October 11th for furnishing and laying cast iron line from Lake to Home Junction.

FOREST GROVE, ORE.—A contract has been let to the Western Water Pipe Company of Portland for the nine miles of piping for the new gravity system here at a cost of $21,536. The pipe will be 10-inch bored wooden pipe.

PORTLAND, ORE.—Sealed proposals are being received for the construction of water mains in Lovejoy, Missouri avenue, East 30th, Grand avenue, and a large number of other streets, according to plans and specifications and the estimate of the city engineer on file.

MADERA, CAL.—An application made by W. B. Taylor of Raymond, for a franchise to lay pipes to convey water along certain streets, roads and alleys in Raymond, Cal., for 25 years. Sealed bids will be received for the franchise by the clerk of the Board of Supervisors up to Tuesday, November 2, 1909.

NAPA, CAL.—The stockholders of the Napa City Water Company have decided on certain improvements to include enlarging the water mains between the waterworks and Napa, creating an additional water supply and increasing the pumping facilities at the plant, and greater distribution in this city.

BELLINGHAM, WASH.—City Engineer Trouhman has submitted estimates on the cost of construction of the proposed intake extension. A pumping station and reservoir will be required. Estimated cost of submerged line totals $112,853.45; shore line, $149,443.50. The latter is favored. The figures include labor and material.